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BRINGING IT ALL TOGETHER

Oregon utility incorporates
innovative technologies with careful
planning to manage growth and meet
environmental impact initiatives

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Troy Beck
Collections Utility
Field Operations Manager
Bend, Oregon

PRODUCT FOCUS:
PUMPS, LIFT STATIONS AND CONVEYANCE



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ON THE COVER: Bend Collections Utility Field Operations Manager Troy Beck outside a recently upgraded lift station in Bend, Oregon. The station incorporates a Titus Twister mixing aerator that uses ozone instead of chemicals to control odor, disinfect, and break up fats and oils. (Photography by Joe Kline)



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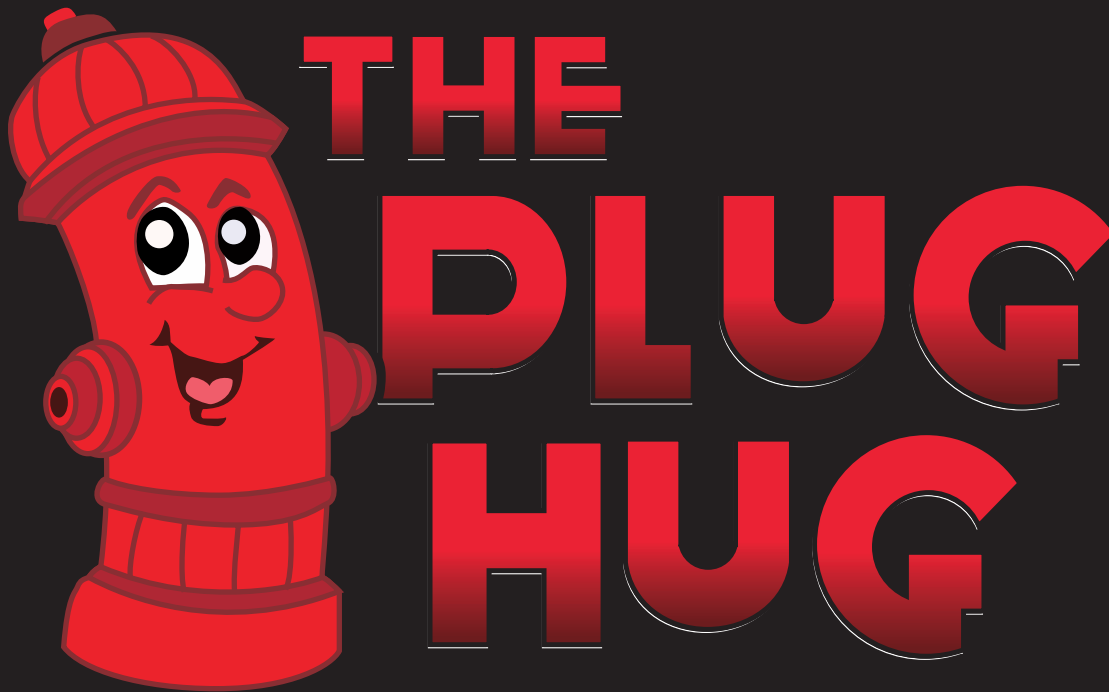
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Published monthly by:

 COLE Publishing

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



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

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



Kayla Bisnette

EDITORIAL CORRESPONDENCE: Send to Editor, *Municipal Sewer & Water*, P.O. Box 220, Three Lakes, WI, 54562 or email editor@mswmag.com.

REPRINTS AND BACK ISSUES: Visit www.mswmag.com for options and pricing. To order back issues, call Andrea Sergent at 800-257-7222 (715-546-3346) or email andrea.sergent@colepublishing.com. To order reprints, call Jeff Lane at 800-257-7222 (715-546-3346) or email jeff.lane@colepublishing.com.

CIRCULATION: 2019 average circulation was 37,440 copies per month (U.S. and international distribution).

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Luke Laggis

WATER CARRIES WEIGHT

Protecting our water resources is the key to protecting our future

Those of you who live in the South may not realize that the frozen lakes of the North support a wide variety of activity in winter: fishing, snowshoeing, snowmobiling, ice golf, even heavy vehicle traffic. Every year there's serious conversation among ice fishermen about when the lake ice will be thick enough to support trucks.

This winter was a strange one. The first half of November was cold, and most lakes iced over early. But then it warmed up and several heavy snows followed. Snow is bad for making ice. It insulates the early ice and creates slush layers. Up-and-down temperatures followed, and the result was the worst ice year I can ever remember. Many wouldn't even drive out on the lakes in late February, when there's usually a couple feet of clear, solid ice

— enough to support a hydroexcavator, according to the Army Corps of Engineers ice thickness and strength chart.

The thing about lake ice in a winter like this, with heavy snow and temperatures cycling up and down, is that it's usually not uniform. No matter how thick the ice is in one area, you never know how thin it might be in another. Slush layers, air pockets and weak ice pose legitimate threats.

The Army Corps of Engineers chart says the minimum ice thickness to support the weight of my truck — about 5,000 pounds — is 8 inches. But the chart is only half of the equation in determining when it's safe to drive out. That number assumes uniform ice thickness, which isn't always the case, especially in early winter. It also assumes that it's clear, sound ice — none of the slush layers or frozen crud mentioned above.

My friends and I are normally driving on the lake we fish — Boom Lake in Rhinelander, Wisconsin — by late December or early January. This year it was mid-February, and only in a limited area, and not without a bit of trepidation. Yet despite all the talk of when or if we'd be able to drive out and all the test holes we drilled to check ice depth, one thought comes to mind: The lake carries far more weight when the ice is off.

Industry, tourism, recreation, property value, tax base — the lake, and it's larger flowage system, feed them all. The town was built at the Pelican Rapids on the Wisconsin River, where the power of the water was harnessed to feed the paper mill. The dam created Boom Lake, a boomage lake to hold the logs that were floated down river for the paper and lumber mills. The city grew around the lake. It's integral to the community's history.

When I was a kid, the river below the paper mill wasn't very clean, but it's greatly improved now. There's a new boat landing and an expanded park near the confluence of the Wisconsin and Pelican rivers, and there are plans for a trail system. People are using the river more, as well as the public space around it.

It's important that we value our water resources. You know that, certainly, but there's always work to be done to inform and educate your community. Whether you're in the arid Southwest or the water-rich Midwest, everyone needs to understand the value of the resources.

The stories of successful utilities that fill these pages month in and month out frequently highlight outreach programs, conservation, resource protection and water-quality improvement, and that's the real story of this industry. You're the protectors of the future, and no role is more important.

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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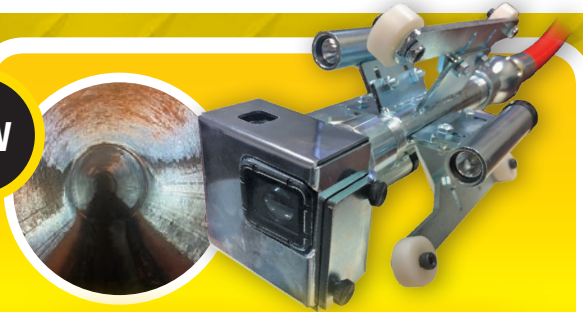
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TOUGH CONVERSATIONS

Managing Employee Relationships

No one enjoys conflict and confrontation. We all want to be liked and accepted, and very few of us enjoy hurting people's feelings. However, leaders must be able to handle conflict in order to effectively do their jobs. You need to be able to hold tough and productive conversations with others and address conflicts that arise within your team.

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OVERHEARD ONLINE

“ People talk about reducing the time you take showers, but if you think about 50% of water flowing through the system being lost, it's another magnitude. ”

— **Researchers Propose New Way To Detect Water Leaks**
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KEEPING CALM

Clean Water in a Crisis

Although Thomas Orcutt has never dealt with a public disaster as big as COVID-19 before, he knows the drill. Plan ahead. Stay Calm. Answer the phone. In mid-March, as the coronavirus alarm began to sound in earnest in this country, town officials in Groton, Massachusetts closed town buildings. Meanwhile, Orcutt and a few other essential employees went to work at the Groton Water Department. mswmag.com/featured



MANUFACTURING HAND SANITIZER

Pivoting for the Public Good

When hand sanitizer started running low at Epoxytec's south Florida headquarters, no one at the company imagined they'd soon repurpose their entire facility and work around the clock to manufacture the product in bulk to fill a local demand. But that's exactly what they did to manufacture and deliver Mano-Care Hand Sanitizer for local first responders amidst COVID-19. mswmag.com/featured



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BRINGING IT ALL TOGETHER

Oregon utility incorporates innovative technologies with careful planning to manage growth and meet environmental impact initiatives

By Suzan Chin-Taylor

On the surface, the city of Bend, Oregon, appears just like any midsize growing city, but unusual patterns of growth in tough terrain have created a unique wastewater collections system with an enormous number of lift stations.

Bend is meeting the challenge, however, and its mission to reduce its carbon footprint and improve the collections system overall is being aided

by progressive ideas, innovations and many new technologies to create a highly sustainable utility of the future for this high desert metropolis.

Built on bedrock

Incorporated in 1905, the city of Bend covers an area of approximately 33 square miles and is home to more than 94,000 residents. The city has seen tremendous growth, from a small city of



PROFILE:
City of Bend (Oregon)
Utility Department

POPULATION SERVED:
94,000

GEOGRAPHIC AREA:
Approximately 33 square miles

EMPLOYEES:
16

COLLECTIONS SYSTEM:
474 miles of main, 404 lift stations

WEBSITE:
www.bendoregon.gov

“Our biggest challenge was making sure that we handled this in a responsible way.”

Troy Beck



Left: Bend Collections Utility workers Justin Young (left) and Joe Johnson maneuver and monitor a Cues MPlus camera system to check a repair they just completed on a sewer line.

Above: Young takes a CUES mainline inspection camera off the inspection van.

Right: A fiberglass patch on a pneumatic packer is positioned in a manhole for a sewer line repair. (Photography by Joe Kline)



to figure out a way to get wastewater conveyed from point A to point B. This created a patchwork of small stand-alone systems. As more developments popped up, code didn't allow the utility to mandate upgrades or improve what was currently in place, so each new development was allowed to create another stand-alone system or drainage basin.

Over time, opportunities existed to improve functionality and tie some of the stand-alone systems together. Varying pressures and hydraulic limitations did not allow all the systems to be connected, so Bend still has a sizeable network of individual drainage basin areas.

Maintenance and improvement

Bend performs most of its routine CCTV inspection, cleaning and maintenance tasks with its in-house crew and a fleet of equipment that includes two CUES CCTV inspection vehicles, four Vactor jet/vac trucks, three service spot crane trucks and eight normal work trucks. Crews also perform some CIPP short-liner point repairs, but the city contracts out the larger projects such as corrosion prevention and manhole-to-manhole CIPP rehabilitation to local specialty contractors. The utility department's CCTV operators are all PACP-certified, and data is captured using GraniteNet data collection software (CUES), which works in tandem with the department's Esri ArcGIS system and asset management software. These tools have allowed the utility to build a robust preventive maintenance program, with a goal of inspecting and cleaning the entire system on a five-year cycle.

In order to reduce future maintenance burdens, new development codes do not allow the addition of local lift stations for new subdivisions. Only gravity sanitary systems are permitted. Bend

is currently revamping and rebuilding some of its existing lift stations that have been identified as long-term essential structures for the system, and several new interceptor lines have also been added to the system to replace lift stations that were taken offline.

These initiatives are all part of the Collection System Enhancement Program that was identified through Bend's Engineering Department.

“We developed a collections system master plan to identify opportunities that would allow us to eliminate a number of lift stations and convert them to gravity-feed,” Beck says. “By the same token, a good number of lift stations cannot be removed or converted for various reasons, so a condition assessment on those has been performed by our crews and we are now mapping out what structures will be upgraded.”

Upgrades for the lift stations will include the installation of new pumps, new drives and in some cases completely new wet well components including controls, transducers and floats. Many of the lift stations will be outfitted with pumps with SmartRun drives (Flygt - a Xylem Brand). The advantages of these pumps for Bend are their nonclog properties and ability to detect resistance from a blockage. The pumps will go into a reverse

35,000 in 1999 to just under 100,000 in 2019, and new development continues.

The Bend Utility Department is responsible for maintenance of the region's sewer and storm-water conveyance systems, as well as treatment. Its sanitary collections system includes 474 miles of pipe and 74 lift stations. In addition to those structures there are 330 residential lift stations that the city is also responsible for maintaining.

“There has been a big effort here in the last few years to upgrade our interceptor lines so we can start moving away from the operations of all these lift stations and shift to more of a gravity or traditional system,” explains Troy Beck, utility field operations manager for the city of Bend Utility Department. “We have challenges to overcome because our terrain is solid rock, so costs to trench gravity mains and interceptor lines can become prohibitive.”

The complexity of the lift station-heavy system came about from development that didn't take place in a uniform pattern as the city was expanding. As developers came in and put in new subdivisions and business parks, the utility had



Bend Collections Utility workers Brent Suing (left) and Joe Johnson apply two-part resin to a fiberglass patch for a sewer line repair.

“This assessment tool helps us focus our line-cleaning and root-cutting efforts where we need it, such as the older parts of town.”

Orrin Libolt

spinning mode, going backward and forward up to 20 or 30 times until it can clear the blockage.

“It can clear these blockages on its own in about 90% of the cases, which has been really helpful so that we don’t have to deploy emergency staff as often,” says Orrin Libolt, collections system super-

visor. “This has reduced emergency-response labor costs. In the rare case when it can’t self-clear, it will alert us so we respond appropriately.”

Bend tries to repurpose as much as possible when dealing with removal, maintenance or upgrading of the lift station structures. “We are working to ensure they are sized appropriately to fit the daily flow rates entering the stations,” Beck says. “We examine many factors or approaches, like complete removal, salvage and also the opportunity to introduce space for the implementation of odor control methods. These factors are weighed in for determining solutions with the best possible return on investment.”

Replacement of access frames and covers in structures experiencing corrosion is also part of the Collection System Enhancement Program. Bend opted to begin utilizing EJ composite access frames and covers, complete with Titus TwistLift Security Locks. The composite lids are easier for crews to lift and handle, and the TwistLift locks have helped standardize their locking mechanism. Over the years, Bend had adopted several locking mechanisms that required crews to carry multiple keys. They are now working to reduce this and phase everything over to this single mechanism.

Reducing the footprint

As part of Bend’s climate action plan and mission to reduce its carbon footprint, the City Council tasked all its departments to investigate
(continued)

SAFEGUARDING THE WATERSHED

Being a high desert city east of the Cascades, Bend, Oregon’s stormwater conveyance system has some unique requirements and characteristics.

Under the responsibility of its Utility Department, which also manages the city’s sanitary collections system, stormwater management for Bend must adhere to strict state permitting. A very small number of outfalls are allowed to the Deschutes River, which runs through the middle of the city. The Deschutes has been designated as a clean and clear river, so the department’s job is to keep the water out of the river.

To maintain compliance with these permitting requirements, Bend’s stormwater runoff is retained in a series of collections structures. Fortunately, the geology in Bend consists of many lava tubes as well as fractured and fissured rock, which allows for the creation of dry well structures that are tied to sedimentation manholes.

During a rain event, water goes through the city’s catch basins and into these sedimentation manholes where it’s given the opportunity to settle out. When it fills up, it overflows and enters a drill hole — a fairly deep, large structure — that acts as a large drainage area with a gravel pack. The water is then allowed to dissipate safely back into the soil or rock and does not impact the river, utilizing the high desert’s natural properties as a low-tech solution to a complex watershed protection requirement.

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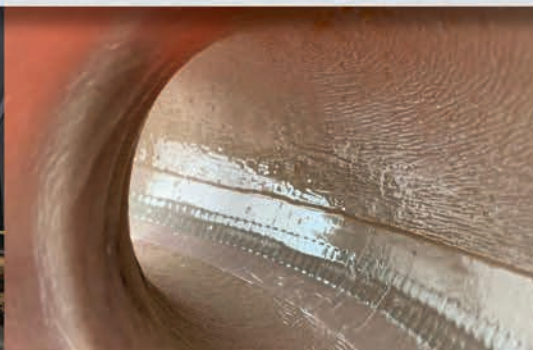


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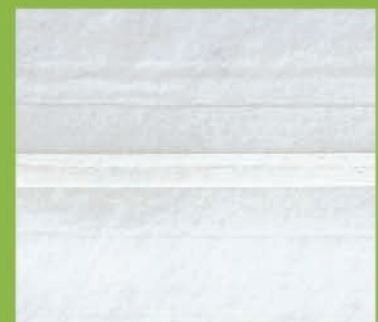
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“Even with the rapid amount of growth, we haven’t needed to increase staff, yet our SSOs are down and our PM tasks are on target.”

Troy Beck

The Bend Collections Utility team includes (from left) Justin Young, Gabe Fonseca, Brent Suing, Joe Johnson, Field Operations Manager Troy Beck and Collections System Supervisor Orrin Libolt.

and implement methods to improve energy efficiency and reduce waste when and where it makes sense.

Bend’s 330 residential lift stations are comprised of a mix of standard pump and vacuum-style units. The 82 vacuum units have some odor emission, but this can be handled effectively with a media filter on the unit’s exhaust pipe, and for the most part, these structures are airtight. The standard stations have always demanded more attention for odor mitigation.

With the goal of reducing the carbon footprint, Libolt and Beck started coming up with ideas related to the standard lift station odor control measures, which were handled by chemicals. These chemicals were sourced and trucked in from Texas. From there, it was transferred to smaller tanker trucks that were dispatched to sites across town for the servicing of the various lift stations.

“We began looking at alternatives to controlling the odor onsite without relying on trucked-in chemicals, and eliminating the tanker vehicles from our fleet as our way to reduce the footprint,” Beck says. “Our biggest challenge was making sure that we handled this in a responsible way and that whatever we shifted to was going to not only be an improvement to what was currently in use, but also fit with our climate action plan goals.”

Bend was given an opportunity to test a new odor mitigation solution from Titus on a two-year pilot program. Titus Twister aerators with an ozone generator have been installed in several lift stations and have produced favorable results with both odor and FOG. In fact, instead of getting the typical complaints from residents near the stations, Bend is getting thank-you letters from residents living near stations with the Titus Twister units, citing that this has created a wonderful and positive change to their neighborhoods.

“As you know, with infrastructure and new technology, it’s all about longevity; but from what we have experienced to date, we’re happy and hopeful this could be a sustainable solution for our lift station odor mitigation,” Beck says. Bend is currently working on the design of another lift station upgrade and has specifically made space for a Titus Twister unit.

The utility department has also made strides in eliminating redundant vehicles and high energy and labor practices from its routine preventive maintenance programs. One highly effective approach has been the use of rapid assessment tools instead of deploying a combination truck to a basin and cleaning it — regardless of whether it’s needed — just because its turn comes up on the maintenance schedule.

The SL-RAT from InfoSense is a rapid acoustic assessment tool that is helping Bend maintain and assess the health of its system more efficiently

both in terms of labor, energy and equipment. “Typically, our system is in good shape in newer areas where it is predominantly PVC and doesn’t need cleaning,” Libolt explains. “This assessment tool helps us focus our line-cleaning and root-cutting efforts where we need it, such as the older parts of town. It is helping us get through our system better, faster and eliminating SSOs.”

Because of all the lift stations, hydrogen sulfide problems and erosion of substrate can be severe in some areas. By cleaning only when necessary, the invasive and sometimes destructive effects of high-power jetting can be reduced, thus helping to extend asset life.

Considering all options

Due to its rapid population and development, Bend has experienced growing pains on multiple levels, but through it all, they have stayed in front of the wave by adopting an attitude of openness toward changing the way they do business.

“We’ve utilized some new technologies and refined how we go about our daily operation and energy consumption. Even with the rapid amount of growth, we haven’t needed to increase staff, yet our SSOs are down and our PM tasks are on target,” Beck shares proudly. “We want to leave it better than we found it. So when we make decisions and evaluate products, we ask ourselves: What advantage is to be gained for our crew, our utility and the ratepayer? Because the decisions we make today will impact the people who will be doing our jobs in the future. If we feel it will make sense to someone 50 years from now, then we know we’re doing the right thing for our community.” ♦

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MEETING FLOW REQUIREMENTS

Temporary bypass system enables Onondaga County pump station to complete major upgrades

By Darrin Ruiz

When the West Side sewage pump station in Onondaga County, New York, prepared to undergo its first major expansion and upgrade in over 30 years, the project required a bypass system to move a peak flow of 30 million gpd.

The West Side pump station is the second largest pump station in Onondaga County, taking in about 8 million gpd of sewage from communities in the western suburbs, then pumping it to a nearby wastewater treatment plant. The expansion and upgrades to the station were designed to add more sewer capacity to help reduce overflows into Onondaga Lake during heavy rains. The project would also expand the pump station's capacity and increase its efficiency.

The county's Department of Water Environment Protection hired local contractor C.O. Falter Construction to oversee the bypass project. The initial design called for using the station's existing pumps during the expansion and upgrades. But it was later determined those pumps could only handle 19 mgd.

Accurate flow data and flow documentation is critical to properly size the bypass pumping system. If the anticipated peak flow isn't determined correctly, then the temporary bypass will not be able to sustain the sewer system during rehabilitation and risks of contamination to the surrounding environment increase considerably as the possibility of a sewage spill becomes more likely.

After determining the initial design missed the target by 25%, it became apparent the job would require a temporary bypass system to meet the maximum flow capacity.

PRODUCT:
Dri-Prime CD300M pump

MANUFACTURER:
Godwin Pumps,
a Xylem brand
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www.xylem.com/dewatering

APPLICATION:
A bypass system to move
a peak flow of 30 million gpd

BENEFITS:
A temporary bypass system
to meet the maximum
flow capacity

USER:
Onondaga County, New York



Onondaga County, New York's West Side pump station expansion project required a substantial bypass system. Project contractor C.O. Falter Construction engaged Xylem to design and install a system to convey the full flow within the same footprint as the original pumps.

One Godwin CD300M Dri-Prime pump was set up on grade and away from the construction area, with two other diesel-driven pumps serving as backups. The combination of diesel pumps and electric submersible pumps allowed the temporary bypass to operate at maximum efficiency.



Tight footprint

C.O. Falter Construction engaged Xylem to design and install a temporary system to convey the full amount of flow within the same footprint as the original pumps. This helped the project avoid road closures and traffic delays.

To stay within the compact station area, Xylem recommended two Flygt N 3312 pumps that could plumb into the existing piping system, resulting in material costs savings.

In addition to the two Flygt N 3312 pumps, the bypass system at the West Side pump station also included three Godwin Dri-Prime CD300M pumps. Housed in a specially designed, acoustically silenced enclosure to minimize noise pollution, the attenuated units reduced pump noise levels to 69 dBs at 30 feet, meeting OSHA noise exposure standards.

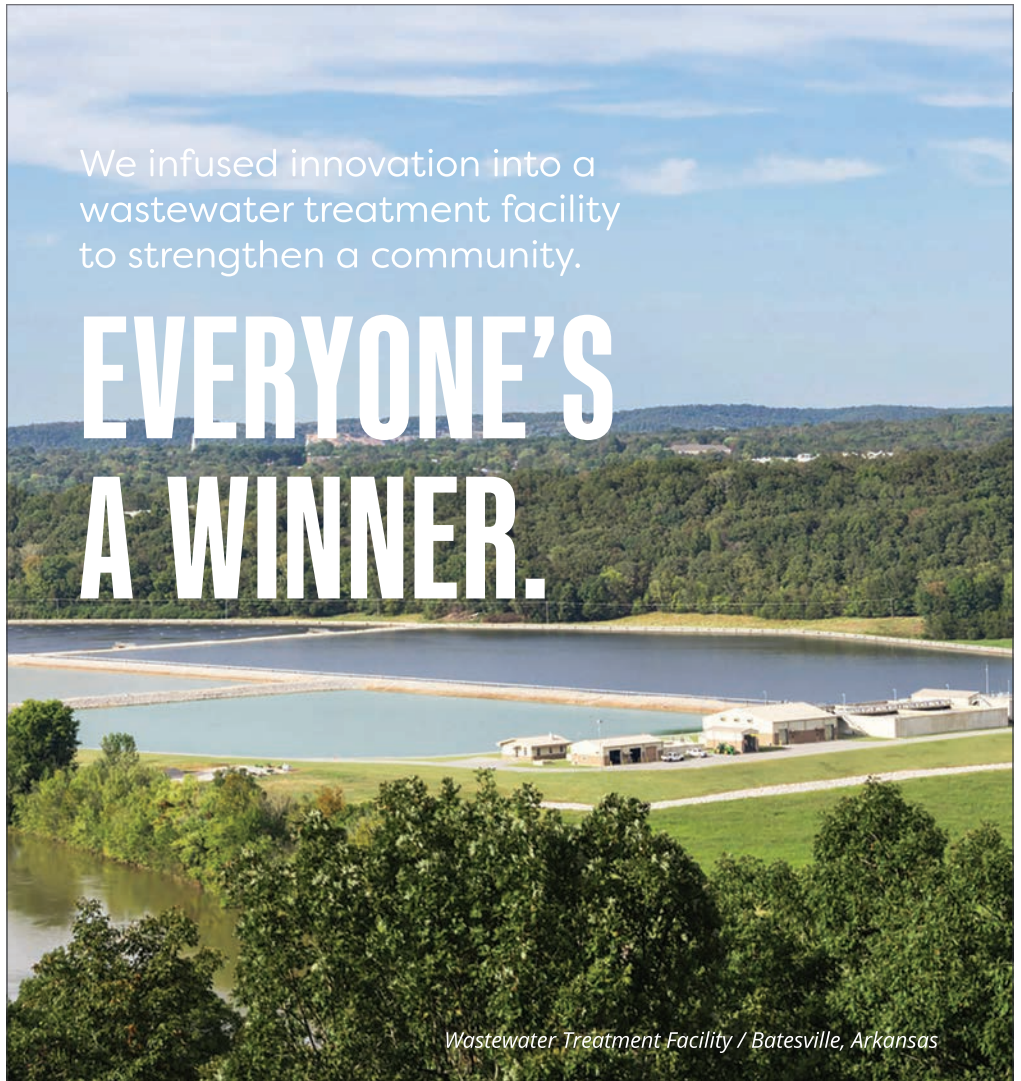
With the pump station located in a high-visibility area between Interstate 690 and Onondaga Lake and overlooking the New York State Fairgrounds, the pump equipment representative explains that loud diesel equipment would not have been appreciated.

One Godwin CD300M pump was set up on grade and away from the construction area, with the other two diesel-driven pumps serving as backups. Backup systems are essential in any bypass operation, as they protect against instances of unexpected high flows or primary system failure during pipe rehabilitation. The combination of reliable primary pumps supported by a robust backup system offers peace of mind, as service is guaranteed to be maintained during loss of power — whether from a scheduled outage or a natural disaster.

The combination of diesel pumps and electric submersible pumps allowed the temporary bypass to operate at maximum efficiency, offering a flexible solution for fluctuating wastewater flow levels.

The diesel pump model used for this project also has the capacity to handle solids up to 3.7 inches in diameter, allowing a wide range of slurries and fibrous materials to easily pass through the pump's impeller and resist clogging. This, along with the portability of the pump, makes it an excellent choice in challenging dewatering applications where sewage, sludge or a large volume of water needs to be removed or redirected.

The Godwin pumps were fitted with variable-frequency drives, enabling operators to control the motor speed and reach the required duty point, ensuring optimum operating efficiency throughout the project. To save energy and diesel fuel costs, each pump activated only when increased flows called for additional pump activity.



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Pumps were fitted with Godwin variable frequency drives, enabling operators to control the motor speed and ensure optimum operating efficiency throughout the project.

Cost savings

Renting the equipment versus the capital expenditure of purchasing it outright also provided a significant cost savings for Onondaga County. Pump rental solutions offer the flexibility to handle complex and evolving applications without having to invest in expensive pumping equipment that isn't required on an ongoing basis.

"A bypass of this size isn't something you do every day," says the pump supplier representative. "For larger projects, end users don't have justification for the cost of the pumps."

Along with providing pumping equipment without capital expenditure, the Department of Water Environment Protection had access to engineers, product experts and service technicians to ensure operations continued uninterrupted.

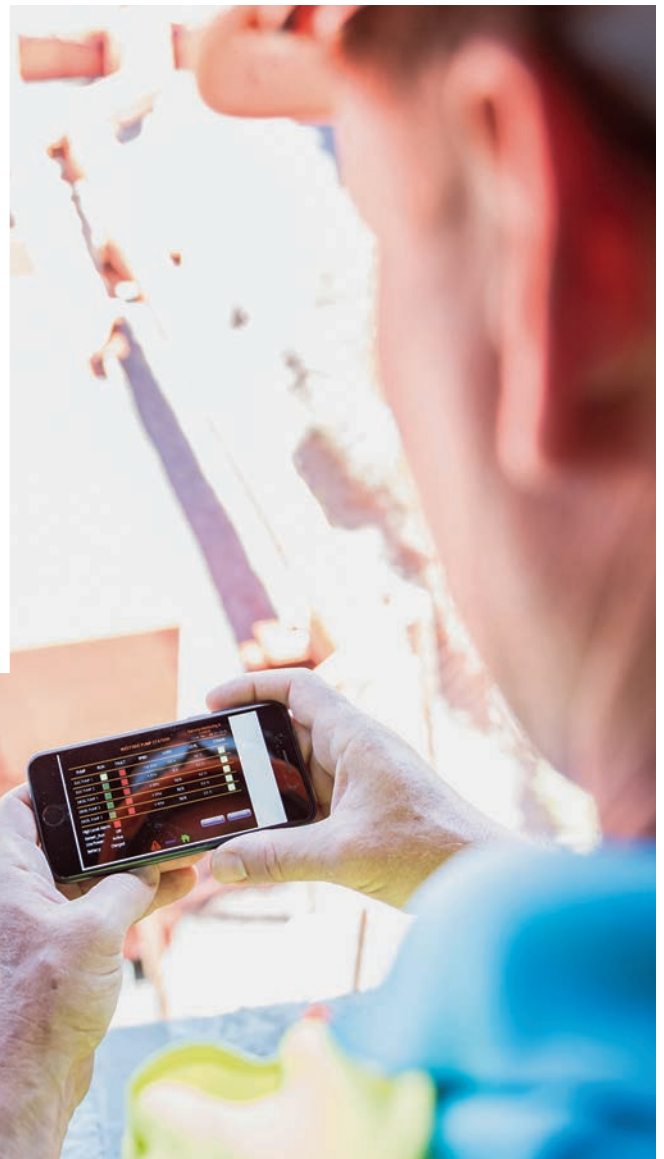
Remote monitoring

The Department of Water Environment Protection and its contractor also needed access to system operations when staff was not on site. To ensure the bypass ran smoothly for the duration of the project, a Godwin advanced remote monitoring and control panel was installed to continuously collect data from the VFD and transducer.

The bypass system went online in March 2018 and ran 24/7 through September 2018. It was set up to emulate the response and flows of the plant's permanent equipment, and remote connectivity enabled the various parties involved in the project to continually monitor the pumps from any location via any smart device.

The remote monitoring capability was especially helpful when the project first got up and running, and fluctuations in the water flow varied widely due to the shifting student population at nearby Syracuse University.

"Syracuse is a huge college town, so there were higher flows when school was in session and then capacity dropped in the summer," says the pump supplier representative. "That's the beauty of remote monitoring. We can watch the equipment and do troubleshooting as needed without having to be on site."



Remote monitoring capability was especially helpful when the project first got up and running, allowing the contractor to address potential problems before they caused a major shutdown.

With the ability to set parameters and alarms for minor issues, C.O. Falter Construction could address potential problems before they caused a major shutdown, optimizing manpower throughout the project.

Dan Falter, project manager for C.O. Falter Construction, notes the ease with which anyone involved in the expansion and upgrade project could monitor the system in real time from remote locations.

"It's pretty slick," Falter says. "If a pump goes down, we're alerted even if we're not on site. The remote monitoring capability provides peace of mind, which is everything."

Along with flexibility and convenience, the remote monitoring and controls capabilities also proved more economical than traditional manned pump watch, representing a substantial costs savings of nearly \$57,000. ♦

About the Author

Darvin Ruiz is the Northeast regional applications engineer for Xylem and its Godwin and Flygt brand pumps, serving the municipal, construction and industrial markets.

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Caution tape seals off the site of an overnight water main repair in the village of Mount Prospect, Illinois. The village water utility has ramped up its water main replacement program, focusing on neighborhood cul-de-sacs and areas around downtown where breaks are most common. (Photography by Bradley Leeb)

SUBURBAN REHABILITATION

Illinois utility focuses on maintaining and improving award-winning distribution system

By David Steinkraus

Operating a distribution system may seem like a simple task compared to managing source water and treatment in addition to distribution, but that's not necessarily the case.

The village of Mount Prospect, Illinois, is a community of 55,000 people situated just a couple miles north of O'Hare International Airport. The suburban community is mostly upper middle class with a couple of business parks and two golf courses within its 10 square miles. One thing it does not have, however, is its own water treatment plant.

Pipe replacement

The village is 100 years old, and its oldest pipes are about that same age. A 2015 study evaluated the village's needs and recommended rate changes and a program to replace aging pipes.

Every year, the village replaced lines, but only a small number because of budget constraints. "But since the water rate study we did, we have increased that to replace every water main within about 130 years," says Casey Botterman, Mount Prospect's water and sewer superintendent. "At the rate we were going before, we were at about 600 years."

The village replaced about 4,000 feet of 10-inch cast iron water main in 2018 with class 56 ductile iron, and another 4,500 feet in 2019. The 2018 work focused on areas where there had been multiple main breaks: in and around downtown where the oldest pipes are located. The project carried additional significance because a redevelopment is planned for a two-block area downtown. The replacement of old 6-inch lines



Using a Wachs hand-held exerciser, Max Orlandi (left) and Sean Feeney exercise a valve in preparation for a water main lining project.

with new 10-inch lines provides more capacity for fire suppression in the area.

Among the pipe replacements in 2019 were some in neighborhood cul-de-sacs. "We average two to three main breaks there a year," Botterman says. "Usually when we dig one up, there are multiple holes and multiple repairs."

When the work was done, the new water mains were looped so they came out of each cul-de-sac. Old mains cut through yards — not a good idea because of the digging necessary in the event of a break. "Currently the breaks have not been in or between the yards," he says. "But our luck would eventually run out."



“We always have something filling and something pumping. We don’t want to have something pumping and nothing filling.”

Casey Botterman



PROFILE:
**Village of Mount Prospect
(Illinois) Water Utility**

POPULATION SERVED:
55,000

EMPLOYEES:
15 (water and sewer)

SOURCE WATER:
Lake Michigan

SYSTEM STORAGE:
8.89 million gallons

DISTRIBUTION:
170 miles of water mains

ANNUAL BUDGET:
\$12 million (operations)

WEBSITE:
www.mountprospect.org

A new model

The village used to draw water from 17 wells and still has five, but those are only for emergencies. Water now comes from the City of Chicago’s Jardine Water Purification Plant on the shore of Lake Michigan. The Northwest Suburban Municipal Joint Action Water Agency, a consortium of local governments, buys water from Chicago and pumps it to member municipalities, including Mount Prospect.

Three delivery structures connect the mains from the water agency to the village distribution system, Botterman says. At no time is the system

idle. “We always have something filling and something pumping,” Botterman says. “We don’t want to have something pumping and nothing filling.”

Although they’re a last resort, the deep wells are checked monthly. Technicians sample the water and run the pumps, but the water drawn goes into the storm sewer instead of the distribution system.

Conservation efforts

Last year, diligent care for the water system earned the village a Utility Water Saver Award from the Illinois Section of the American Water Works Association.



The Mount Prospect Water Utility team includes, front from left: Joe Markelonis, John Frank, Brad Coop, Jay Gomez and Tonya Bracher. Back: Mike Schuster, Max Orlandi, Doug Petro, Jake Sprow, Jeff Burger, Sean Feeny and Casey Botterman.

“Definitely the amount of water used has gone down.”

Casey Botterman

The village’s award-winning work on water conservation includes automated metering and submetering for multifamily housing, development of a plan to sustain the system, and repairing and replacing inefficient infrastructure.

“Definitely the amount of water used has gone down,” Botterman says. Fewer people use municipal water on their yards because of the cost; and codes require water-efficient fixtures in buildings. Before automated metering, residents in apartment buildings would call in their meter readings. Once a year, the village would audit those accounts. “And, surprisingly, it was pretty accurate,” Botterman says. “They were telling the truth.”

The award nomination covered the village’s multipronged water-conservation work. It includes:

- A biannual leak detection program
- Fire hydrant replacement running seven

months each year

- Regular quality tests of commercial and other nonresidential water meters
- Replacement program for older water meters
- Locating and exercising of distribution system valves, plus valve repair and replacement
- A water main upgrade project

In addition, a community education program provides dye tablets to residents at no charge. Tablets allow residents to see quickly whether the flapper valves in their toilets are leaking; as AWWA information points out, a leak of 100 drips per minute equals water loss of 350 gallons per month. Included in community education are annual open houses for the Public Works Department that typically attract more than 3,000 people who learn about their water supply through posters, hands-on exhibits and games.

Complications

One of the more unusual challenges Mount Prospect faces involve an entirely different type of infrastructure: the three sets of train tracks

cutting through the middle of the village. These carry freight trains and commuter trains to and from Chicago and its suburbs. From about 5 a.m. to 1 a.m., commuter trains move through the village in both directions about once an hour — every 20 to 30 minutes during rush hours.

Water pipes run beneath those tracks. “We have valves on each side to isolate it if there is a break there,” Botterman says. Fortunately there aren’t too many locations where pipes cross the tracks. Still, the 2015 study called for replacing those pipes. That would mean some type of digging or perhaps directional boring, but the railroad’s right-of-way extends into the soil, and it is unclear what restrictions the railroad may place on such a project.

Because of the complications involved in digging, the best potential solution is cured-in-place pipe lining. Next to the railroad tracks is another complication: U.S. Highway 14, under the control of the state Department of Transportation and with a water main running directly beneath it. In late 2019, the village began lining 3,700 feet of 12-inch cast iron main under the road.

SECURING THE FUTURE

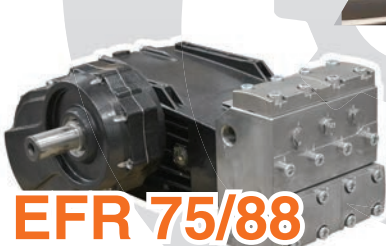
Mount Prospect buys water from a large consortium of local governments — the Northwest Suburban Municipal Joint Action Water Agency — and has its own wells. It also has backups to make sure water keeps flowing to customers.

There are interconnections with the neighboring suburbs of Arlington Heights and Des Plaines, says Casey Botterman, water and sewer superintendent. The village also connects to Illinois American Water, which serves two small pockets of the village.

But in an effort to improve water security, the village is looking into another option.

“The Northwest Water Commission has a transmission main to Arlington Heights that runs right through Mount Prospect,” Botterman says. “This is a long-term project and we’re at the beginning, but we are looking to have an interconnect with them. Then we would have two straws in Lake Michigan.”

Both consortiums would supply Chicago city water, but if something ever went wrong with the primary supply from the water agency, the second connection would allow the village to operate a couple of valves and have a large supply of water.



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The state requires new pipe installations to be sleeved, and because of existing utility lines, new water pipes would have to be about 13 feet below grade. Current lines are 6 to 7 feet down. The estimated cost of laying pipe beneath the road makes lining attractive.

The top recommendation in the village's 2015 study was to enlarge the 12-inch main under the highway to increase the water supply capacity on the north side of the village, improve flow for fire suppression in the redevelopment and improve

the movement of water to the village's elevated tank. Because of the complications of working under the road, the planned new 16-inch line will take an alternate route through neighborhoods.

"It will be like a transmission main, but there will be residential taps off it," Botterman says.

Regular maintenance

In addition to the long-term projects, Botterman's crew keeps busy with annual work. Each spring and fall, a crew visits every hydrant and listens for leaks. Workers also replace 25 to 30

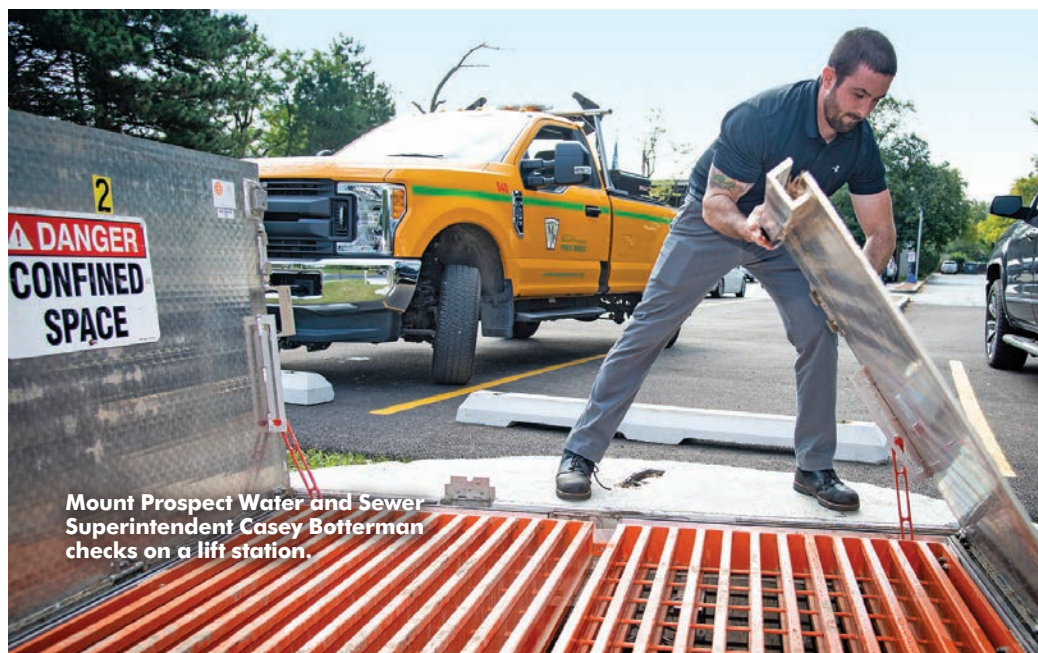
hydrants annually. They're old models and no longer manufactured, so as technicians pull the old hydrants, they save the parts.

Each year, workers operate about 25% of the town's valves and assess their condition. Five to 10 valves are replaced each year. Buffalo boxes, a type of curbside valve, are checked on a six-year cycle.

"We check to see if, for one, we can locate it and get the key on it," Botterman says. "The result of the inspection will lead into our repair program if we need to dig something up or to locate, raise or lower one."

In 2019, the village finished rehabilitating the last of its seven water tanks, ranging from 1 to 2 million gallons. Six are steel, and the other is concrete. All roof beams on the last tank were replaced because of slight corrosion. There was some miscellaneous steel work, the interior was blasted and painted, and the exterior received spot priming and a full coat of paint.

It's a lot of work keeping up a system without a water treatment plant, but it keeps Mount Prospect on track for a future with reliable water. ♦













Mount Prospect Water and Sewer Superintendent Casey Botterman checks on a lift station.

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IT'S A MARATHON

Gender-diversity program slowly gains traction at Southern California water utility

By Ken Wysocky

The issue of succession planning in the face of fast-retiring older workers continues to vex water and sewer utilities nationwide. But the Metropolitan Water District of Southern California is parlaying the so-called silver tsunami of exiting baby boomers into an opportunity to make inroads in another problem area: gender diversity.

In particular, the Los Angeles-based utility, which provides water for nearly 19 million people living in Los Angeles County and five surrounding counties, has focused on its Engineering Services Group. By changing how it recruits women engineers and establishing strategic retention programs, the percentage of female engineers in the group more than doubled to 27% (out of 142 engineers) in 2019, up from 13% in 2006, says Diane Pitman, human resources manager for the district.

“The internships give them an opportunity to learn about our systems and then spread the word about what it’s like to work here.”

Diane Pitman

“We’re pleased with those numbers,” she says. “They may not seem dramatic from a percentage standpoint, but we only hire five to 12 entry-level engineers a year. We look at this as a marathon, not a sprint.”

Increasing gender diversity at the district, where only about 25% of the utility’s roughly 1,750 employees are women, isn’t easy. Almost 500 of the

utility’s employees work in skilled trade-related positions — areas where it’s difficult to find suitable female job candidates. And 98% of those 500 workers are men, she notes.

“We do the most hiring in that area (for skilled craft and trade workers), so it’s difficult to impact the percentage of females,” she points out. “Water utilities have been male-dominated for a long time, so it’s harder to increase the percentage numbers (of women).”

Furthermore, the utility competes against private sector engineering firms that can offer better pay and higher-profile projects. “Everyone is fighting for the same few women engineers,” she says.

On the other hand, the wave of retirements poses a unique opportunity to reshape the face of the engineering group, Pitman says. From 2012-18, 110 employees retired, which is about 3% a year; many of them were hired in the late 1980s and early 1990s after the district initiated several new capital improvement programs.

“It definitely presents an opportunity to address issues such as diversity,” Pitman says. “Our general manager likes to talk about the fact that he’s always seeing new faces in the cafeteria because we’re hiring people as fast as they retire. And that’s changing our culture in a positive way.”

Hiring practices, internships

The focus on gender diversity gained momentum about 10 years ago when utility officials noted that the percentage of female engineers at the utility didn’t proportionately mirror the national percentage of engineering degrees earned each year by females. In 2018, that figure was about 21%, according to a report compiled by the American Society for Engineering Education.

A review of the situation revealed a primary obstacle: the utility’s hiring practices for engineers, which centered on hiring more senior- or principal-level engineers.

“There are more females graduating with engineering degrees, but not at that level,” Pitman notes. “So to impact the numbers, we realized we needed to hire more at the lower levels, because that’s where you can find more qualified, degreed females who are ready to enter the workforce.”

Of course, the utility needed to ensure that entry-level positions would be available for graduating females; this was accomplished by striving to create five to 12 openings a year through retirements. “We took a risk that we might hire a few extra people, but on the other hand, they’d be trained and ready to go, which would save us time later,” Pitman says.

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.



“Water utilities have been male-dominated for a long time, so it’s harder to increase the percentage numbers (of women).”

Diane Pitman

Furthermore, to boost the utility’s profile among college students, the district offers an internship program for juniors and seniors at about a half dozen local colleges and universities. About 15 students a year participate in the internships, which began in 2002.

Students earn credits while they work 20 hours a week for the utility. So far, about 200 students have participated in internships. Of those, the district hired seven. Five of them were women.

“The internships give them an opportunity to learn about our systems and then spread the word about what it’s like to work here,” Pitman explains. “Word-of-mouth is a great recruiting tool.”

Support programs are key

Keeping female engineers on board also poses challenges. To increase retention of both female engineers and those in nonengineering positions, the utility formed two support/networking groups that include mentoring components: the Metropolitan Chapter of the Society of Women Engineers and the Women at Metropolitan.

“Once we get them in the door, we have to work hard to keep them, and those groups help us do that,” Pitman says. “They provide a support system and encouragement, plus they see women succeeding in nontraditional roles, such as managers.”

In addition, the district strives to provide new employees with a big-picture perspective that ensures they understand the utility’s important mission, as well as its history, says Rebecca Kimitch, press office manager.

“We give them a sense of the value of what they’re doing and the importance of bringing water to Southern California,” she explains, noting that the onboarding process includes tours of various facilities. “When they understand the mission of what they’re doing, it helps them buy into that mission — wins their lifelong allegiance to the organization. It’s a very intentional and strategic approach to employee retention.”

Pitman adds that studies show that today’s younger employees want more than just a job and a paycheck — they want to feel like they’re making a difference. And the utility’s onboarding process shows how new employees are doing just that, she says.

Last but not least, boosting gender diversity — and diversity in general — requires more than just meeting a certain number or percentage of certain kinds of employees. Organizations also have to create inclusive cultures where new employees feel comfortable and welcome.

“Newer and younger employees have a lot of new ideas, but many times long-time employees want them to learn before they express those new ideas,” Pitman says. “So there’s a communication issue that requires changing the ideas of acceptance and inclu-

sion. You can’t retain employees if they don’t feel like they’re included.

“We can’t focus on just the numbers because they’re just a snapshot in time,” she adds. “We still have work to do, even if the numbers of female engineers, for instance, are improving, because new cultures and ideas bring new challenges. We’re constantly looking at ways to better support those younger employees because retention is the key.” ♦

Editor’s note:

This article is part of an ongoing series that examines how water and sewer utilities are handling succession planning in the wake of the industry’s looming labor shortage.

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CIPP EMISSION SAFETY

Trenchless Technology Center releases final report and safety recommendations

By Sheila Joy

After nearly two years of extensive study, the Trenchless Technology Center at Louisiana Tech University has released its final report: *Evaluation of Air Emissions From Polyester Resin CIPP With Steam Cure*. The nearly 700-page report, available at www.nassco.org, details the measurement of styrene and other organic compounds at multiple CIPP installation sites across the country.

The report provides several recommendations and conclusions based on the survey data.

Liner transport trucks and storage units

- For those immediately entering the liner transport truck or storage unit, active air monitoring should be utilized at the initial opening of the truck or storage unit door to ensure a safe work environment.
- At the initial opening of the liner transport truck or storage unit door, suitable personal protective equipment should be worn by those immediately entering the truck or storage unit.

Emission stacks

- A perimeter of 15 feet should be implemented around exhaust manholes and emission stacks during curing. This perimeter could be entered for short amounts of time not exceeding five minutes. If this area must be entered for longer than five minutes, suitable PPE should be used.
- Emission stacks should be a minimum of 6 feet in height to enhance the dispersion of emissions and lessen the likelihood of workers entering the perimeter from having to cross into the plume even when wearing PPE.

The Trenchless Technology Center made further recommendations for future study including focusing on task-oriented worker exposure to emis-

sions to identify certain tasks within the typical eight-hour shift window that could pose health risks; better understanding the dispersion of styrene from the liner truck after opening; and gathering more data to correlate the number of liners being stored on the truck, the liner sizes and the duration the liners have been on the truck with emission concentrations.

NASSCO has made additional, interim recommendations to keep workers and communities safe:

- Until more comprehensive recommendations are prepared, NASSCO recommends air monitoring by workers entering the liner transport truck or storage unit, either immediately after opening the unit door or after a designated wait time.
- Workers should wear suitable PPE based on the results of the air monitoring when entering the truck or storage unit.

Moving forward

NASSCO's Technical Advisory Council is working closely with the association's Health and Safety Committee to develop and/or modify safety guidelines based on the Trenchless Technology Center's findings. Additionally, NASSCO has formed a CIPP Safety Workgroup to develop outreach and consider further research.

While NASSCO committees and work groups are typically open only to NASSCO members, the CIPP Safety Workgroup is an exception because we want all leaders aligned to CIPP technology, including academia, industry and others, to come together to help NASSCO set standards to keep our workers and communities safe.

If you are interested in being part of this important work group, please contact me at director@nassco.org. For more information, visit www.nassco.org/news/cipp-study. ♦

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

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

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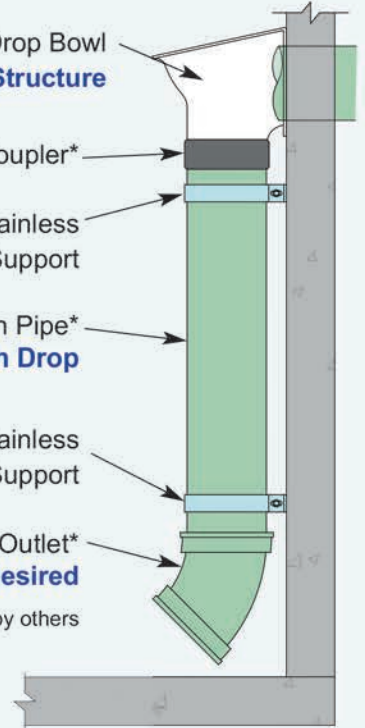
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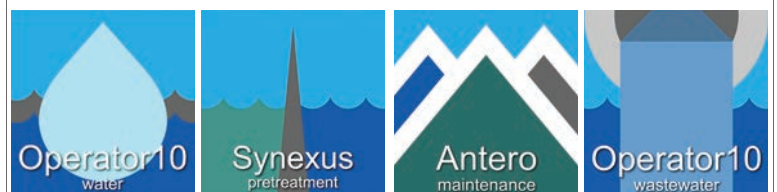
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DON'T ASK FOR TROUBLE

Mitigate the risks of manhole work by fully embracing safe practices

By Giles Lambertson

Manholes are vertical and confined — two conditions that lead to falls and to being felled by dropped tools — and could be rife with deadly gases. Entering such a workspace casually is asking for trouble.

“I’ve heard stories about pre-OSHA days when people would jump in a manhole to do the work, and if they started feeling light-headed, they’d jump out,” says Russell Shoats, project manager at TLC Plumbing & Utility in Albuquerque, New Mexico. Like most firms today, TLC embraces OSHA regulations and operates with a safety-first mindset. “The goal is to make sure everyone comes home safely.”

Major hazard

Among other infrastructure services, TLC contracts with the city of Albuquerque to completely replace manhole structures and rehabilitate manholes. The

latter normally consists of regrouting the barrel after sulfuric acid has corroded the surface.

The acid is a product of the chemical compound hydrogen sulfide, which is a colorless, flammable gas that is toxic and heavier than air. Not only that, its rotten-egg odor deadens a person’s sense of smell. Consequently, someone breathing it can be lulled into not being alarmed until the body collapses.

That gas is the principal hazard in manhole work. “H₂S is the big one. It will knock you unconscious,” Shoats says. “You want to enter a manhole with no harm or risk, but H₂S is the one we try to mitigate.”

To detect the level of threat, workers rely on gas sensors such as ones manufactured by Texas firm Gas Clip Technologies. The Gas Clip units come in several versions, with the most sophisticated model capable

“We use that word — culture — quite a bit, but if you are not living and breathing safety every day, you’re not exercising it.”

Dave Balogh



The confined, vertical nature of manholes presents a variety of safety concerns that must all be addressed before entry.

of taking readings of hydrogen sulfide, carbon monoxide and oxygen levels, as well as chemical compounds that become flammable in certain concentrations.

A pump version of the device allows a crew to attach and lower a tube to the bottom of the manhole. The pump pulls any gases present in the confined space upward to the sensor, which then gives a crew standing at the manhole entrance a readout of what lurks below. "Some people prefer to attach a cord to a sensor, lower the sensor into the manhole, then pull it back up to see what it tells them," says Jeremy Majors, technical representative for Gas Clips. "I prefer the pump."

A nonpump version of the Gas Clip sensor is worn by each crew member who enters a manhole that's declared safe. One reason for wearing a detection device in an already-tested environment is that conditions can change hourly. After lunch, for example, the flow of sewage typically increases, which can alter the concentration of gases.

"And one reading from up top is not a reading for an entire manhole or pipeline," Majors says. "If a crew member goes 20 feet either way from the spot where the air was drop-tested, he can encounter a different atmosphere."

The individually worn sensor doesn't just produce readings. It's an alert system. "It vibrates, it lights up and it has a speaker that produces a minimum of 95 dB of noise when threatening conditions develop," Majors says. "So, even if you are wearing hearing protection and can't hear it, you can feel the vibration and see the flashing light."

Some manufacturers produce sensors that send readings up to crew members outside the manhole,

keeping them aware of conditions underground. "But those units are more expensive," Majors says. He notes that an average industry standard for a sensor ranges from \$600 to \$1,000.

Other risks

Toxic gases are certainly not the only hazard manhole crews encounter in their work. Falling while climbing down or up the manhole ladder is a danger, so a descending crew member typically wears a harness attached to a cable. The cable runs through a pulley mounted on a tripod straddling



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Never enter a manhole without confined-space gear. It is literally your lifeline to the surface should anything go wrong.

the manhole opening and connects to a winch. When the opening is too large for a tripod, a cantilevered arm with a pulley is utilized. In either case, the attached cable will arrest the fall of a worker who misses a rung.

A four-person crew is standard for TLC manhole work — two entering the hole, one on the winch and a fourth person periodically reading a gas monitor and fetching tools and material as needed. “You don’t want the man on the winch leaving it to get a hammer,” Shoats says.

Lighting is a safety issue as well. Ambient light isn’t always enough. “Some people hook a light fixture to a cantilever or tripod, but I don’t recommend it,” Shoats says. “It’s hard to direct the light, and the fixture is another object that can fall and hit someone. What I like to do is buy the guys some headlamps for their hard hats. That’s the best way to provide light in the least-invasive way.”

There is another option. Shane Jacobson, a sewer contractor in Iowa, has invented and patented a manhole lighting device he calls a Light Ring. “A buddy and I were out on a job and he asked, ‘Is there something you can buy to light up a manhole?’ I looked around to see if there was a product out there.” There wasn’t, so Jacobson created one.

The Light Ring is a bright, safety-orange device that attaches snugly to the surrounding edge of a manhole. A downrigger can be affixed to it as a roller guide for video cables, jetter hoses and other lines. When a switch is thrown to activate an 18-volt lithium-ion battery, LED lighting floods the hole, greatly enhancing visibility for inspection, rehab or more extensive repair work — and creating a safer working environment.

“Right at noon, the light difference is minimal because there’s so much light down there already,” Jacobson says. “But during the morning or afternoon sun, the Light Ring really lights up the hole. That’s especially true at night, of course. Plus, mounting the downrigger on the ring keeps the cable out of the middle of the opening so you don’t lose open space. It makes work a lot more productive.”

The Light Ring is a reputedly tested product: Jacobson’s sewer services firm — CIT Sewer Solutions — was awarded the American Public Works Association 2019 contractor of the year award in Iowa. Utility departments in such far-flung cities as Sacramento, California, Omaha, Nebraska, and Fargo, North Dakota, are illuminating their manhole projects with the Light Ring, but full-scale production of the device has not yet begun.

Building culture

In the end, safety equipment is not as important as attitude in preventing injuries and fatalities. Hard hats, waders, gloves, gas detectors, adequate light, gas masks, fans to create fresh airflow when gases have pooled dangerously — all of these are vital to safety, but the faithful following of safety procedures by crew members is the single most effective incident prevention tool.

“It has to be part of your culture,” says Dave Balogh, vice president of business development and strategy in the Taplin Group, which provides a variety of underground infrastructure services in Michigan. “We use that word — culture — quite a bit, but if you are not living and breathing safety every day, you’re not exercising it.”

The company developed a sweeping safety system it calls ELKS, an acronym for elimination of loss through knowledge and stewardship. ELKS is a behavior-based safety program. That is, it inculcates a safety mindset in employees and ultimately changes their behavior. Hence, Balogh’s admonition about living and breathing it.

The key to the program’s success is the authority given to every crew member to stop work on a project because of a safety concern. “Everyone

“All of this stuff is handled before we ever enter a manhole, making sure that everyone is on the same page.”

Russell Shoats



Hydrogen sulfide is a silent killer, and workers should never enter a manhole without a gas monitor.

has the same authority, whether he’s been with the company for one minute or 10 years,” Balogh says. Work stoppage isn’t recorded every day, obviously, but occurs as often as someone speaks up.

If an objection is raised, the crew revisits the morning job planning meeting and determines if safety is indeed being compromised. The company also reports on near-loss incidents to see what can be learned from the narrow escapes. If a procedure needs changing, it is done so and then codified, according to Balogh.

“If we see that a JSA (job safety analysis) report for a project is written one way and isn’t appropriate for what’s before us, we modify it to make it safer. Then we send the change back to our safety director to add it to future JSA planning. We’re constantly seeing what works best.”

TLC’s approach to safety is nearly as methodical as Taplin’s. Shoats says every project has a stated safety goal tailored to a job. A checklist of safety equipment is run through. A job hazard analysis checklist is worked up and scrutinized by the entire project team. “All of this stuff is handled before we ever enter a manhole, making sure that everyone is on the same page.”

Furthermore, everyone entering a manhole has completed confined-space safety training. “Everyone at TLC goes through the class, an initial one after they are hired and periodic classes throughout the year. An employee cannot enter a confined space without the class being taken.” ♦



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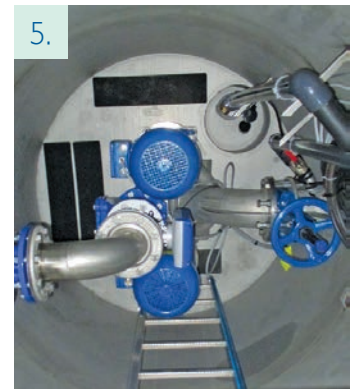
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PUMPS, LIFT STATIONS AND CONVEYANCE

By Craig Mandli



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2. Gorman-Rupp Integrinex Advanced

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3. Greyline Instruments PSL 5.0

The **PSL 5.0** pump station level controller from **Greyline Instruments** has redundant level sensing. It includes a noncontacting ultrasonic sensor and can be connected to a loop-powered pressure sensor for redundant

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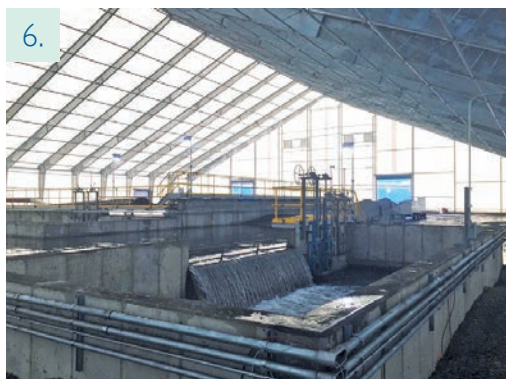
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4. Epoxytec CPP Sprayliner MH

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5. Industrial Flow Solutions OverWatch

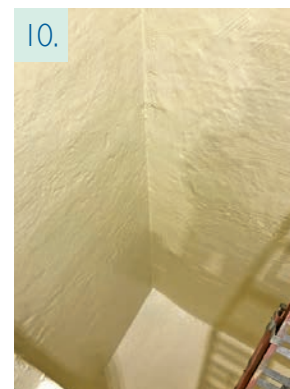
OverWatch from **Industrial Flow Solutions** is a modular concept designed in all stainless steel and performs all the functionality of a traditional lifting



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6. Legacy Building Solutions tension fabric buildings

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7. Pollardwater Premium Ultra-Grease Block

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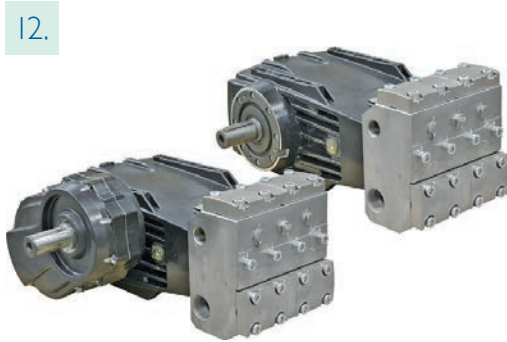
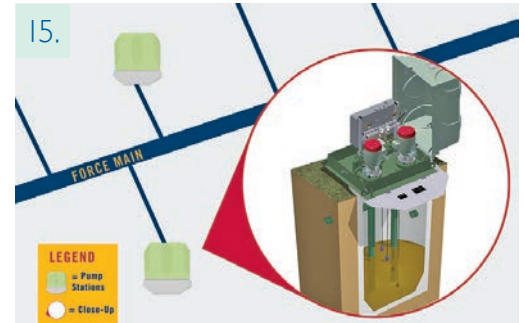
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10. Sauereisen SewerGard 210XHB

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(continued)



substrates, reducing time spent waiting for the substrate to dry out. It is also resistant to hydrogen sulfide, sulfuric acid, microbiologically induced corrosion and wastewater treatment chemicals. Installation is completed using plural-component spray equipment. **412-963-0303; www.sauereisen.com.**

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Pumps

11. Boerger BLUEline

The **BLUEline** rotary lobe pump from **Boerger** is a self-priming, valveless, positive displacement pump used to convey viscous and abrasive materials. There are 21 pump models in six series with pulsation-free operation, fully reversible rotation, dry-run capabilities and flow rates up to 7,500 gpm. The pumps are stable and wear resistant with a maintenance-in-place design that allows for all wetted parts to be easily replaced through the front cover without the removal of pipe or drive systems. **612-435-7300; www.boerger.com.**

12. Comet Industrial Pumps EF and EFR 75/88

EF and **EFR 75/88** high-pressure plunger pumps from **Comet Industrial Pumps (A Division of Valley Industries)** easily handle up to 23 gpm, 4,060 psi and 43 hp. Flexible setup allows for multiple gearbox mounting positions, and a symmetric crankcase allows for simple right-to-left shaft conversion. They are designed with stainless steel and aluminum alloy to provide increased durability. They come standard with heavy-duty seals that have low-pressure lubrication and a circulation chamber. They include oversized tapered roller bearings, solid ceramic plungers, stainless steel piston guides and connecting rods with thin-shell bearings. They come standard with a flange for a direct-drive mount, but they can be adapted for a hydraulic motor, a PTO connection or set up with an input pulley and clutch. **800-864-1649; www.cometpump.com.**

13. Vaughan self-priming chopper pump

Self-priming chopper pumps from **Vaughan** are designed to be easily

SCADA Systems

14. GE Digital Proficy iFIX 6.1

Proficy iFIX 6.1 from **GE Digital** enables smart operators by leveraging the latest technologies to deliver greater efficiency for operations while speeding time-to-insight for system integrators. It includes a native OPC UA client driver, web-based configuration with automatic tag population in its database, and high-performance alarm-related Dynamos to decrease deployment time while increasing operational efficiency in a secure-by-design method to improve equipment uptime and reduce cost and risk. In addition to an HTML5 optional interface, it has a graphical engine to modernize the HMI/SCADA experience to reduce operator errors and improve response time to events. **800-433-2682; www.ge.com/digital.**

15. Smith & Loveless Force Main Sync

Force main pressures vary; and without accounting for the variable conditions, reduced service life and a multitude of other issues arise. These phenomena result in impeller and volute erosion, reduced bearing and seal life, excessive pump noise, and vibration. **Force Main Sync** from **Smith & Loveless** monitors hydraulics in the common force main to keep pumping at the required flow rate. Using a programmable logic controller touch-screen human-machine interface, a variable-frequency drive and a force main sensor, it constantly senses force main pressure and automatically adjusts the VFD to maintain a constant flow rate, no matter how many stations are online. **800-898-9122; www.smithandloveless.com.** ♦

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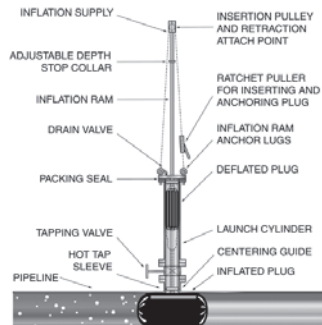
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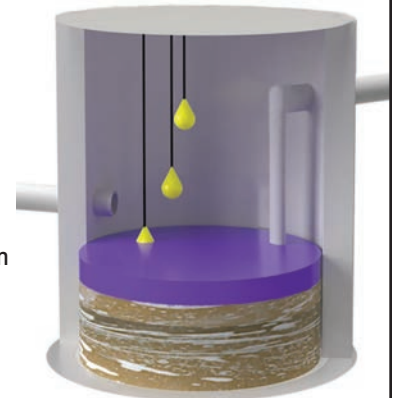
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CASE STUDY

PUMPS, LIFT STATIONS AND CONVEYANCE *By Craig Mandli*

Grinder rectifies issues with rags and debris



Problem:

For many years, a water reclamation plant in Texas successfully used six Penn Valley Double Disc Pumps for its primary sludge and scum applications. At its latest expansion project, the plant added macerators in-line ahead of all the pumps to enhance their process and grind rags and debris. With the installation of the macerators, they suffered severe problems with plugging of the pump suction lines. That led to increased workload and man-hours and frequent pump rebuilds.

Solution:

After years of frustration, they turned to the 10K Muffin Monster from JWC Environmental. It is a compact grinder that's tough on solids in sludge applications. It fits into areas with limited space requirements while still providing the necessary power for downstream protection. It also saves on electrical costs, using half the energy needed for high-speed macerators. The pump grinds the primary sludge and debris that is pumped to the digesters.

RESULT:

Its efficiency has proven so great that the plant no longer keeps all six pumps running. They have installed three Muffin Monsters and are now grinding more reliably with less energy. There's no need to rebuild or stop sludge pumping to manually cut away the debris. **800-331-2277; www.jwce.com.** ♦



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Product Spotlight

Hydroexcavator provides longer life

By *Tim Dobbins*

Purchasing a hydroexcavator is a sizeable investment for your company, and giving thought to the reliability of the equipment is equally as important as the functionality. The makers of the Vacall AllExcavate hydroexcavator believe they have built a truck that gets the job done, with features engineered to prolong life span.

“Nobody wants to dig around a gas line anymore, and utilities know the safer way and only way to dig is with air or hydroexcavation,” says Bill Petrole, vice president of Vacall.

AllExcavate models are designed for excavating soil, rocks and clay around utility lines or foundations using a high-pressure jetting action up to 24.5 gpm and 3,000 psi. Once material is loosened, a vacuum suctioning up to 27 inches Hg and 5,800 cfm pulls material and water back into the debris tank. Each model is available with three different boom and hose design options to accommodate numerous applications.

To ease the process of dumping into on-site roll-offs, AllExcavate models offer high dump capability. This allows the debris tank to be raised up to 76 inches above the ground and shifted back 21 inches for dumping over the edge of a container.

“It’s a dependable product and does the job well for everybody,” Petrole says. It offers a multistage vacuum filtration system that works by continuously moving air through a dual-cyclone separator as material is deposited into the debris body. By doing so, more particles and mois-



ture are removed, and the filtered air is able to pass through the blower, silencer and exhaust. The process is designed to reduce maintenance and extend the working life of the truck.

A “Green That Works” package comes standard on the trucks and includes AllSmartFlow intelligent controls and a CANbus control system that allows operators to make precise boom adjustments, improving job site efficiency. Single-engine operation to power both the chassis and the jetting and vacuum functions is used to reduce fuel consumption and emissions.

To further extend life, debris tanks are engineered extra strong and water tanks are built from high-quality aluminum and positioned above large rear fenders to protect them from possible outside damage from road debris or rocks.

Investing in a reliable hydroexcavator can keep the jobs coming and business booming, according to Petrole. “From what I can see, the use of hydroexcavators is growing in the U.S.,” he says. “I think it’s only going to get better.” **800-382-8302; www.vacall.com.**



Reed Pump Stick pump

Reed’s Pump Stick is a durable, battery-operated pump that provides a job site-friendly way to remove water. Use with an 18-20-volt battery by replacing the battery adapter plate with one designed for common, slide-style battery models. Its hard-shell, aluminum main shaft is built to last. To keep the impeller free from debris, choose from multiple screens, strainers and filters. Reed’s Pump Stick ships with a 2-foot hose but also offers 4- and 7-foot hose

extensions. The Pump Stick lifts water up to 12 feet. A long, slim design reaches deep into small cavities: The pump is 38 inches from bottom tip to hose outlet, and a comfort-grip handle brings the pump to 4 feet. For extra reach, add the optional 2-foot comfort-grip handle. Universally useful, the Pump Stick battery-operated transfer pump is ideal for contractors and maintenance departments.

800-666-3691; www.reedmfgco.com.

NJBSoft Sampling and Monitoring System

The Sampling and Monitoring System by NJBSoft is a cloud-based environmental compliance management software for drinking water and wastewater systems. SAMS delivers real-time compliance tracking for environmental programs through email deadline alerts, milestones, sampling events and upcoming site inspections. The mobile application and web-based platform keeps samplers, managers and compliance staff up to date 24/7. The dashboards feature data archival for traceability, automated reporting and audit readiness. And GIS map-based visualization allows on-time reporting for cost-effective operations. **602-759-1905; www.njbsoft.com.**



CUES Lifter Plus II access cover tool remover

The CUES Lifter Plus II access cover tool remover can be rear- or front-mounted. The hydraulic tool can be used on conventional-size covers and grates and for more challenging removal tasks. It is ideal for front-mounting on vacuum trucks; a connection to the vehicle battery is all that's required. The cover removal tool is a quick solution for stuck-in-place covers, and it prevents worker injuries. **800-327-7791; www.cuesinc.com.**



Reelcraft Industries REELSAFE controlled-return hose reels

The REELSAFE Series RS7000 controlled-return hose reels from Reelcraft Industries plays out like a traditional reel but is specifically engineered to retract the hose at an average walking speed. The centrifugal clutch, integral to the reel base, greatly decelerates the hose retraction speed by up to 83% versus a Series 7000 reel. **800-444-3134; www.reelcraft.com.**



General Pipe Cleaners Speedroooter XL

The Speedroooter XL from General Pipe Cleaners clears tough clogs in 3- to 10-inch lines up to 200 feet. Now with easily interchangeable drums, the rugged, easy-to-manuever Speedroooter XL sports a powerful 3/4 hp motor and 100-foot-capacity drums for Flexicore cable. To change drums to add cable lengths or swap cable sizes, loosen three knobs and remove the drum. Switch between 3/4- or 5/8-inch cables in the large drum design or substitute the small drum with 100 feet of 1/2-inch cable for smaller lines. The see-through inner cage lets you quickly gauge how much cable remains. The adjustable-height, swept-back handle provides maximum maneuvering leverage. The durable design



features a braced frame at key stress points, as well as front and rear drum supports for longer bearing wear. **800-245-6200; www.drainbrain.com.**

Southland Tool ST-PRO Cam video camera nozzle

The ST-PRO Cam video nozzle from Southland Tool provides exceptional and affordable 4K or 1080p viewing capabilities. The compact design features a waterproof camera case and zinc-plated body and thrust nozzle. It has a self-leveling GoPro camera and a rear 1-inch thrust nozzle with eight jets. Nylon wheels up to 18 inches and 6- to 8-inch adjustable skids are available. It also has integrated Wi-Fi that is downloadable to a phone app. **714-632-8198; www.southlandtool.com.**



Mohawk Lifts ML-220 two-post lift

The model ML-220 from Mohawk Lifts is a new 20,000-pound-capacity two-post lift. Designed with three-stage arms, the lift is designed for the lifting points of medium-duty work trucks or retracting to service short-wheelbase vehicles. With a direct-drive, all-hydraulic lifting system and no overhead cable covers, the ML-220 ensures it can fully lift high-profile vehicles. The lift includes full sets of truck adapters for servicing all vehicles. **518-842-1413; www.mohawklifts.com.**



Vactor iMPACT combination sewer cleaner

The iMPACT, a versatile new combination sewer cleaner from Vactor, replaces the outgoing Vactor 2103. The iMPACT has a compact design that allows it to easily maneuver through tight spaces and is ideal for cleaning catch basins, sanitary/storm sewers, laterals and lift stations. It features the IntuiTouch control system. Inside the cab, one-touch controls are used for quick PTO activation and engagement. Outside the cab, a rotating control panel with up/down adjustment has a touch screen and glove-friendly tactile buttons, providing immediate data. The exclusive Jet Rodder water pump provides continuous flows through its entire operating range. **800-627-3171; www.vactor.com.**



Interprovincial Corrosion Control PetroWrap anti-corrosion tape

Petrolatum-based PetroWrap anti-corrosion tape and primer from Interprovincial Corrosion Control is tested and compliant with CSA Z245.30 and AWWA C-217 standards. The tape consists of a non-woven, stitch-bonded, synthetic fabric that has been fully impregnated with neutral petrolatum-based compounds and inert fillers. It is moisture resistant and requires no maintenance. **905-634-7751; www.rustrol.com. ♦**



Wacker Neuson announces management changes

Wacker Neuson's executive vice president of sales and marketing, Johannes Schulze Vohren, announced he will retire from the organization at the end of 2020. Schulze Vohren's departure will conclude 26 years of service to the company. Schulze Vohren will assume the position of director of digitalization for the remainder of his tenure with Wacker Neuson. Effective Feb. 3, 2020, Joe Miller has been promoted to vice president of sales and marketing, U.S. Named director of marketing for North America in 2017, Miller came to Wacker Neuson after 12 years with a leading U.S.-based compact equipment manufacturer, where he held management positions in sales, marketing, product management, brand identity and customer satisfaction.



Johannes Schulze Vohren



Joe Miller

Koch named as McElroy's new vice president product development

McElroy announced the appointment of Geoff Koch, P.E., as vice president of product development. Koch joins McElroy after nearly 25 years with Ditch Witch, where he was vice president of product development. At McElroy, he will be responsible for design, prototype build, and testing of all new equipment in addition to supporting McElroy's current and extensive line of pipe fusion products.

Anue Water Technologies promotes Bock

Anue Water Technologies promoted Gregory Bock to the new position of vice president general manager. Since July 2018, he served as Anue's vice president of operations. In his new role, Bock will be responsible for operations and all commercial relations. This includes the company's line of FORSe and Phantom systems for wastewater treatment through oxygen and ozone injection, remote digital telemetry systems, Enviroprep systems for rapid elimination of FOG, and carbon-impregnated Anue geomembrane covers for cost-effective odor control.



Greg Bock

Utilis partners with SITE Technologies on property assessment platform

Utilis has signed a contract with Chicago-based SITE Technologies to provide soil moisture data derived from satellites to SITE's Total Property Assessment platform. SITE, a member of the Rabine Group, currently provides site assessments to thousands of commercial customers across the U.S., Canada and Mexico.

Grundfos and Augury sign partnership agreement

Grundfos and Augury, a data analytics company, are taking a step toward digitizing water and utility infrastructure worldwide by signing a long-term strategic partnership. Together, they will develop smart diagnostics solutions and services for Grundfos' customers. The two companies have already been working together successfully over the past two years to test new products and service offerings across several markets and industries. Now, they are committing to offering a range of services and new business models enabled by connected equipment.

Pelican Products' Corti promoted to chief commercial officer

Pelican Products has combined its consumer division (outdoor/adventure, hunt, fish, camp, etc.) and commercial/government division (military, fire/safety, police, industrial, aerospace, etc.) into a single unit. Stephan Corti has been promoted from his previous position as president of the company's commercial/government division to chief commercial officer, leading the combined entity. ♦

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WORTH NOTING

PEOPLE/AWARDS

Rob Hogan was hired by the city of Woodstock (Georgia) as assistant city manager for the Public Works Department and Water & Sewer Utility.

Vik Bhide was hired by the city of Tampa (Florida) as transportation and stormwater services director.

Brandon Klenzendorf, a senior engineer with Geosyntec Consultants in Austin (Texas), was named a winner of the 2020 Engineering News-Record (ENR) Texas and Louisiana Top Young Professionals contest. He focuses on technical stormwater management, water resources design and regulatory compliance projects.

Ben Horenstein, general manager for the Marin Municipal Water District (California), received the National Environmental Achievement Award for Distinguished Service from the National Association of Clean Water Agencies. ♦

CALENDAR

May 17-21

World Environmental & Water Resources Congress, presented by the Environmental & Water Resources Institute of the American Society of Civil Engineers, Green Valley Ranch Resort, Spa and Casino hotel, Henderson, Nevada. Visit www.ewricongress.org.

May 20-21

American Society of Civil Engineers Watershed Management Conference, Green Valley Ranch Resort, Spa and Casino Hotel, Henderson, Nevada. Visit www.asce.org.

June 14-17

American Water Works Association Annual Conference & Exposition (ACE), Orange County Convention Center, Orlando, Florida. Visit www.awwa.org.

July 12-15

American Society of Agricultural and Biological Engineers Annual International Meeting, CHI Health Center, Omaha, Nebraska. Visit www.asabe.org.

Aug. 3-5

Florida Rural Water Association Annual Conference, Hilton Daytona Beach, Daytona Beach, Florida. Visit www.frwane.net.

Aug. 9-12

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

Aug. 10-13

National Association of Flood and Stormwater Management Agencies Annual Meeting, Stein Eriksen Lodge Deer Valley, Park City, Utah. Visit www.nafsm.org.

Aug. 17-19

StormCon, Washington State Convention Center, Seattle. Visit www.stormcon.com.

Aug. 30-Sept. 2

American Public Works Association Public Works Expo (PWX 2020), Ernest N. Morial Convention Center, New Orleans. Visit www.apwa.net.

Sept. 14-16

National Rural Water Association WaterPro Conference, Phoenix. Visit www.nrwa.org.

Sept. 30-Oct. 1

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

Oct. 20-22

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

Oct. 28-31

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

Nov. 9-12

American Water Resources Association Annual Conference, Embassy Suites by Hilton Orlando Lake Buena Vista South, Kissimmee, Florida. Visit www.awra.org.

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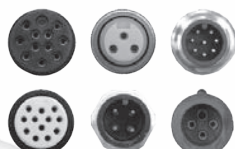
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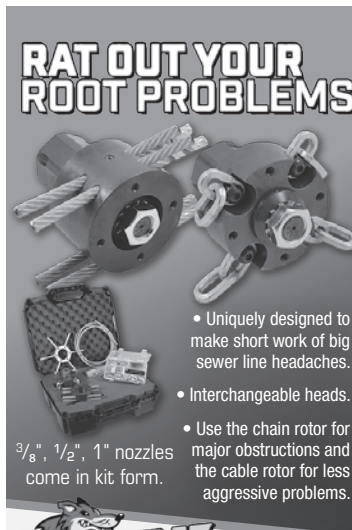
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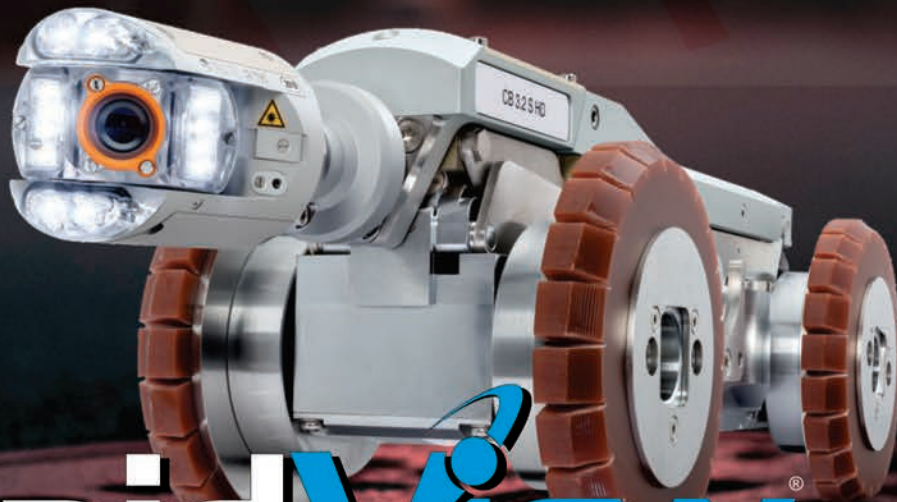
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