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March 2011

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EXPO
ISSUE

NO EXCUSES

Fort Worth keeps SSOs in
check with system upgrades
and great maintenance

PAGE 14

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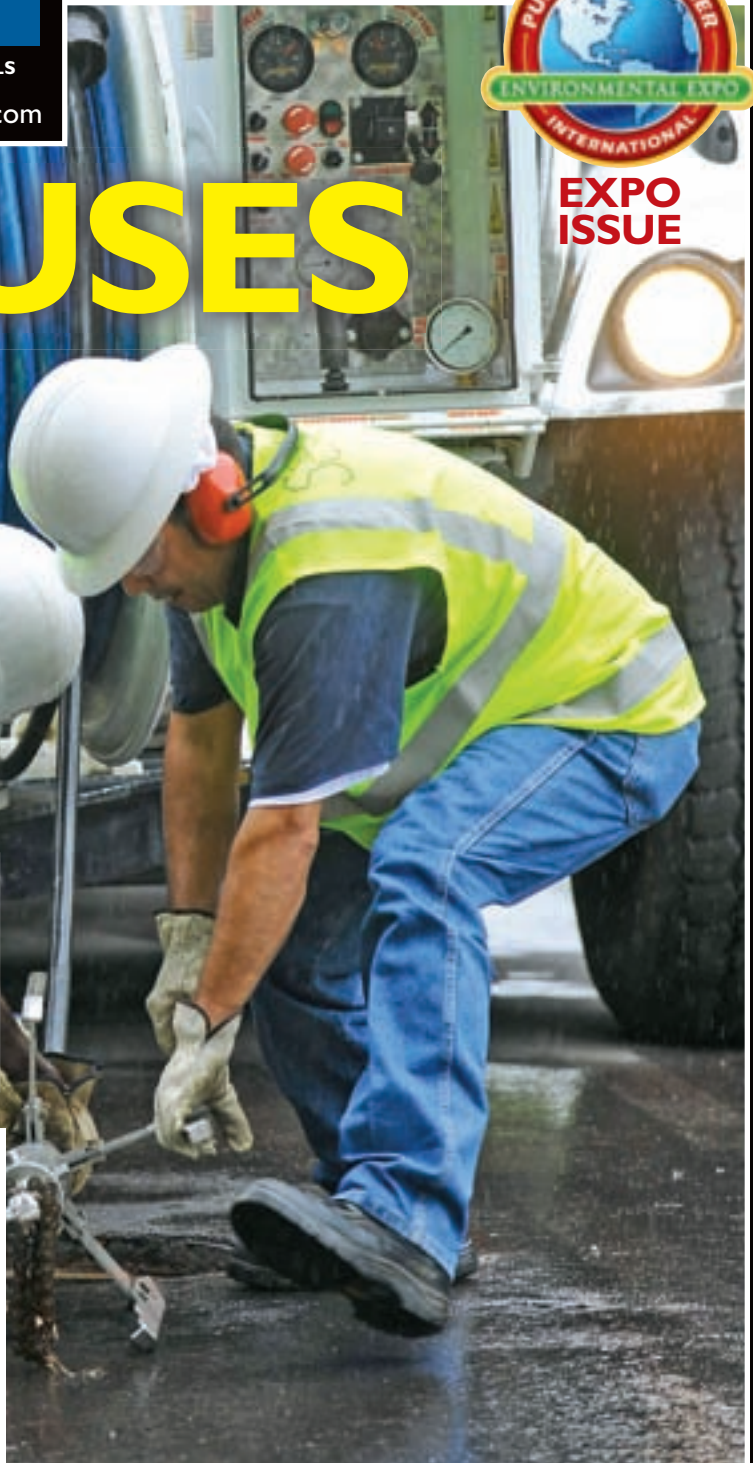


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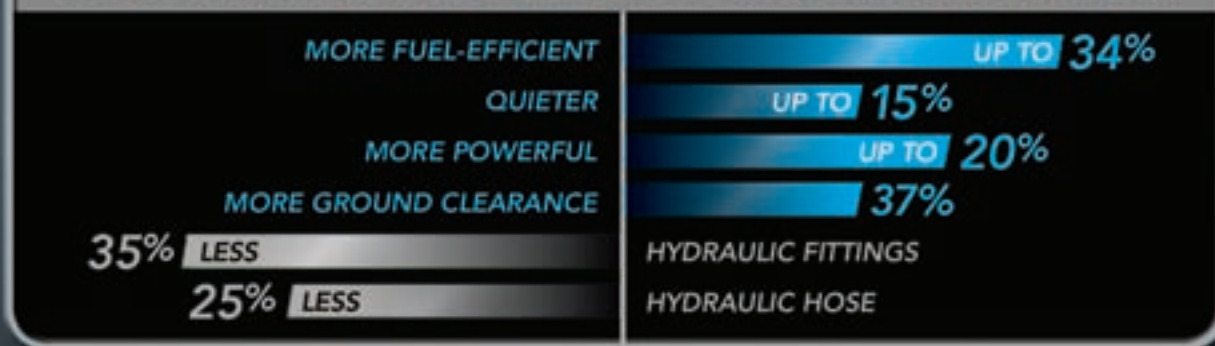
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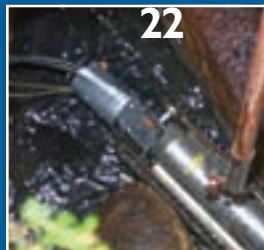
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INSIDE:

2011 PUMPER & CLEANER ENVIRONMENTAL EXPO INTERNATIONAL ISSUE



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COVER:

Hands-on control of maintenance and well-organized interactive divisions help the Fort Worth (Texas) Water Department overcome SSOs caused by grease, I&I, and root intrusion. Here, maintenance worker Arayleius Wells (left) and crew leader Robert Serna ready equipment for a neighborhood sewer line cleaning powered by a GapVax combination truck. (Photography by Glen Ellman)



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Special Issue: Manholes and Catch Basins/ Pumper & Cleaner Expo Recap

- ◆ Sewer: In-house grouting program in Salem, Ore.
- ◆ Sewer: Manhole rehabilitation in Fairfield, Ohio
- ◆ Sewer: Manhole sealing for I&I control in Milwaukee, Wis.
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MARCH 2011

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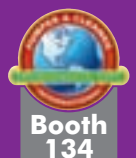
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MORE WITH LESS?

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FROM THE EDITOR

Ted J. Rulseh

What about this idea of “doing more with less”? Municipal managers have heard it for years, and it’s now perhaps more in vogue than ever.

Can you really “do more with less” — be so efficient and so good at finding better ways that a smaller staff with a reduced budget can accomplish more than last year? Or are you in fact being asked to “put 10 pounds in a 5-pound bag” — that is, do the impossible? I ask in all seriousness and would love to hear responses from the ranks of infrastructure managers.

I ask because I keep seeing municipal budgets get cut, or capped at very small increases. And while I don’t necessarily see streets in my hometown crumbling and water mains breaking and sewers leaking, I see EPA estimates of the shortfall in infrastructure spending going up or staying the same. And I see the grades on various infrastructure report cards holding steady or getting a little worse year to year.

Of course, those are macro views of the world. What’s the micro view — from where you sit today? In these austere times, is your water and sewer infrastructure getting better? Getting worse? Staying the same?

Notable successes

We tend to report on successful infrastruc-

ture programs, and some of the stories are inspiring. Last December we wrote about the Detroit Water and Sewerage Department and how it has reinvigorated pipe maintenance, using everything from advanced GIS technology to systematic upgrades to the fleet of sewer cleaning trucks.

If great strides can be made in Detroit, one of the most economically distressed big cities

For the benefit of your peers in the infrastructure business, tell us what it’s like in your world. Share stories of how you do more with less, or do more with the same. Tell what grade you would give your own storm sewer, sanitary sewer, and water piping systems — and which way that grade is trending.

in the nation, then why not anywhere? (It must be said that Detroit wasn’t “doing more with less” — there was an infusion of money from sewer and water rate increases.)

In a future issue we’ll describe how five small Wisconsin villages inspect their sewer systems cost-effectively by sharing one camera system. There’s an innovation that surely saves money.

We also report fairly often on communities assigning more infrastructure repair functions — grouting, cured-in-place pipe lining, pipe bursting — to in-house crews to reduce reliance on contractors and cut expenses. One

example of an agency relying more on in-house crews is Pinellas County (Fla.) Utilities, profiled in this issue.

Fees vs. taxes

Arguably it’s a bit easier for utilities to keep up than for school systems or city street departments because utilities rely on user fees, and it’s easier to raise those when needed than to raise property or other taxes. Still, these days no one likes to pay more for any public purpose, and no entity can be accused of having a blank check.

So, for the benefit of your peers in the infrastructure business, tell us what it’s like in your world. Share stories of how you do more with less, or do more with the same. Tell what grade you would give your own storm sewer, sanitary sewer, and water piping systems — and which way that grade is trending.

If you want, talk about the stresses of keeping your systems in top shape and what you would do — if you were in sole charge — to make them better for today and the future.

Whatever stories, opinions or ideas you share, we’ll pass them along to 36,000 readers in jobs similar to yours. To share information, just send a note to editor@mswmag.com, and I promise to respond. The issues are critical. This is your forum, and now is the time. ♦

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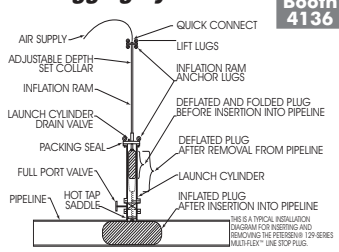
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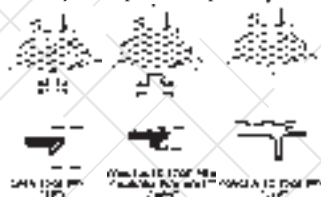
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NO EXCUSES

The Fort Worth Water Department keeps SSOs in check with collection system upgrades and world-class maintenance

By *Scottie Dayton*

Hands-on control of maintenance and well-organized inter-active divisions have enabled the Fort Worth (Texas) Water Department to overcome SSOs caused by grease, inflow and infiltration, and root intrusion.

These are familiar challenges for many municipalities, but what separates Fort Worth from other large cities is the size of its maintenance program, coupled with a \$232 million Wet Weather pro-

gram that upgraded the collection system. The city has gone from 1,415 SSOs per year in 1998 to 82 in 2009.

Such success attracts officials from around the Southwest, who come to look and learn. The success also extends to treatment operations: In 2010, the city received the Platinum Peak Performance Award from the National Association of Clean Water Agencies, recognizing the treatment plant for 20 consecutive years of operation without permit violations.

Managing FOG

With a population of 736,000 spread over 350 square miles, Fort Worth is the 17th largest city in the nation. The Field Operations Division manages 3,400 miles of 6- to 96-inch concrete, vitrified clay and other types of sewer lines, 28 lift stations and 75,000 manholes. To manage the work, the division divided the city into 360 subareas, each with 40,000 to 50,000 feet of pipes that are analyzed on a rotating schedule, their conditions ranked, and work prioritized.

The strategy resulted from a 1993 U.S. EPA administrative order. The city completed its Wet Weather I&I reduction program in 2001, a year ahead of schedule, and now maintains those efforts with a staff of 446.

Maintenance issues focus on grease, I&I and root intrusion. "Our grease comes from dense populations, such as apartment complexes," says Rick Davis, wastewater collection system superintendent. "Consequently, we have a strong public education program

(continued)



PROFILE:
Fort Worth (Texas)
Water Department,
Field Operations Division

FOUNDED:
1884

POPULATION:
736,000

AREA SERVED:
350 square miles

EMPLOYEES:
446

INFRASTRUCTURE:
3,400 miles of sewer pipes;
28 lift stations; 75,000 manholes

ANNUAL BUDGET:
\$140.2 million

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Crew leader Robert Serna (left) and maintenance worker Arayleius Wells ready equipment for a neighborhood sewer line inspection with a GapVax combination truck. (Photography by Glen Ellman)



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Maintenance worker Alejandro Escobar lowers a camera into a sewer line for an inspection. Fort Worth operates nine camera vans.

that includes inserts in utility bills, door hangers and vignettes on our local cable channel about keeping grease out of the sewers.”

Before Thanksgiving and Christmas, the Pollution Control Division Pretreatment Section ramps up the campaign, encouraging residents to pour cooking grease into a jar or can, add cat litter to solidify the fat, and place the container in the trash. They even set out grease collection containers during holidays.

“We also have a strong pretreatment program run by the pretreatment group,” says Davis. “They inspect and sample restaurant and industrial flows, permit the industries and size restaurant grease traps. While we’ve looked at some new grease trap products, the old reliable two-chambered trap works best for us.”

Nevertheless, pretreatment can’t address all the grease issues. Some areas have high concentrations of restaurants, and some pipes have bellies that accumulate grease.

When blockages or complaints alert Field Operations, crews remove



Utility line technician Nathan Greer reviews footage from a mainline inspection.

“We don’t accept excuses. This approach has helped us locate many root problems before they could cause backups.”

Kirit Patel

hard blockages caused by grease or roots with sewer jetting trucks and circular hydraulic-powered saws, or a modified flexible chain cutter that does not damage pipe walls.

“My crew redesigned the skids on two KEG Super Cutters,” says Kirit Patel, assistant superintendent of the Preventive Maintenance (PM) Section. When clearing grease, a flusher truck follows the jet truck, working manhole to manhole to degrease the line and adding Magnum Flow III chemical formulation from Municipal Industries Inc.

No excuses

The city hires contractors to clean and inspect all lines larger than 24 inches. It also insists that every line of any size is inspected from manhole to manhole. “We don’t accept excuses,” says Patel. “This approach has helped us locate many root problems before they could cause backups.”

Root intrusion is prevalent in the older part of the city, where shallow sewers run beneath alleys or across easements heavily planted with trees and shrubs. After the Sewer Section selects the areas for cleaning, the staff uses Maximo

BECOMING SELF-SUFFICIENT

From average flows of 106.5 mgd, the Village Creek Wastewater Treatment Plant in Fort Worth, Texas, generates about 50 percent of its total energy requirements on site. Methane gas, captured and recycled from the anaerobic digestion process and purchased from a nearby landfill, powers one of two 5.2 MW turbine generators.

The plant uses the excess heat from the turbines to heat the digesters. Future construction of a more extensive heat recovery system will reduce the electricity used for centrifugal blowers in the aeration basins.

After a project to convert two 1,000 hp blowers from electricity to steam drive, the plant will generate more than 75 percent of its total electricity.

asset management software from IBM to generate work orders to the PM Division.

“We insist they inspect the cleaned lines to verify that all the major roots are gone,” says Patel. “A month or two later, we hire a company to foam the pipes with Razorooter II, a diquat-based herbicide from Duke’s Root Control.”

After an area has been treated, it is monitored for customer complaints and backups. “Crews also return periodically and do quality assurance/quality control to make sure no roots are growing,” says Patel. “Root control is a significant part of our sewer program. We clean and treat about 500,000 feet per year.”

Proper tools

Before the Wet Weather pro-

gram, the city had three inspection crews but no combination machines. Today, it has nine combination trucks from manufacturers including Vactor, Hi-Vac and Jet-Vac.

Also in the fleet is one sewer flusher with a Jet Eye inspection system from PipeHunter. The truck enables cleaning and inspection of a sewer line in a single operation: Crews can see what is happening in the line during the cleaning process and detect problem areas.

“The flusher truck never stops running,” says Patel. “Part of the reason is Paul Kristynik, who maintains all our camera equipment and some of the combination units. Keeping the work in-house saves us a lot of time and trouble.”

The Sewer Division cleans 1.2

(continued)

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The Fort Worth preventive maintenance team includes, front row, from left, crew leader Robert Serna, maintenance worker James O'Neil, crew leader Leandro Escobedo, and maintenance workers Forrest Curry, Miguel Garcia, Emiliano Franko, Tereso Alvarado, and Jose Serrato. Back row, maintenance worker Arayleius Wells, utility line technicians Nathan Greer and Jermaine Brown, maintenance worker Lamont Bradford, utility line technician Eric Fontaine, crew leader Jackie Wilson, utility line technician Kyle Grannan, maintenance workers Reginaldo Criado, Ricardo Recio and Don Tranfanstead, senior instrumentation electronics technician Paul Kristynik, and utility line technician John Cheek.



Rick Davis, wastewater collection system superintendent.



Travis Andrews, Water Department assistant director in Field Operations.

to 1.5 million feet of pipe per year and inspects it with eight camera vans from CUES and one from Aries Industries. Workers also use GatorCam3+ inspection systems from Radiodetection for smaller pipes. The videos are analyzed daily by technicians in the Field Operations Technical Section.

While asset management software is essential, Field Operations is proud of how seamlessly the various sections work together. "We

team the vacuum truck crew with the TV crew and work out the whole system simultaneously," says Patel. "We also send a support crew with them to help solve access issues. They do whatever it takes to inspect 100 percent of the pipe from manhole to manhole."

Condition assessment

After the Sewer Section identifies structural problems in pipes, it recommends spot repairs, CIPP lining or replacement with PVC pipe. "When we do a master plan, we look at the pipes' condition and criticality," says Davis. "Age doesn't necessarily mean that the pipe is bad, as we've found some old pipe in better shape than newer ones."

The department uses a rating system to rank projects from 1 (very good) to 5 (needing immediate attention). "Point repairs or maintenance on number 4 pipes will give us a couple more years of service," says Patel. "We constantly monitor 1, 2 and 3 conditions to watch for deterioration." Reports go out to various divisions and

sections as soon as crews complete the cleaning and inspections.

While Field Operations designs the sewer maintenance program, it coordinates with Engineering and Fiscal Services for new sewer designs and line replacements. The city replaced 18.4 miles of pipe in 2009. Designs for rerouting sewers are contracted to engineering firms.

"If the city tears up a street, our Engineering and Fiscal Services coordinates with the city's Transportation/Public Works Department to replace the water and sewer lines simultaneously if required," says Davis. "We also have numerous new major road projects calling for us to relocate and upgrade large-diameter lines."

Travis Andrews, Water Department assistant director in Field Operations, is proud of how effectively the staff attacks problems to maintain the system. "They're using technology, sophisticated analysis, and their combined expertise to target our limited resources efficiently, and we're getting results," he says. ♦

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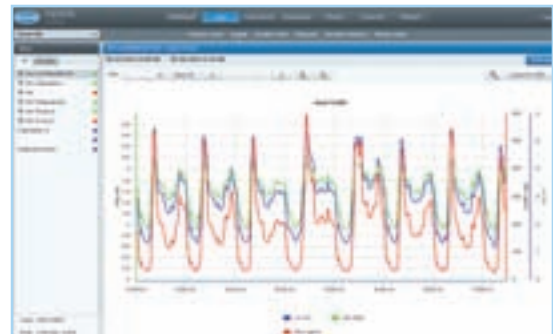
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PATENT PENDING

Jeff Gallo, utilities specialist 2, operates a Vactor 2100 combination truck on a sewer cleaning run. (Photography by David Hanko)

FOCUS: SEWER

BEST CREW FOR THE JOB

Pinellas County Utilities adapts to tight fiscal times by relying more on in-house maintenance crews and focusing contracting on specialized services

By Dan Heim

The General Maintenance Department of Pinellas County (Fla.) Utilities serves a county with the state's highest population density, at about 3,300 residents per square mile.

Maintaining that area's water and sewer systems is a challenge in the best of times, and budget constraints brought on by a declining economy make it tougher still.

But department director Alan Bollenbacher and his team have adapted, putting in place a rigorous sewer inspection and maintenance cycle that relies more than

ever on in-house employees and equipment.

The county's cost studies to date have shown that in-house teams can do routine, scheduled work more cost-effectively than outside contractors. So the department invests in up-to-date equipment to provide those services and reserves contractors for more specialized projects and for help during peak workloads.

The approach is serving the department well as it takes care of two separate sewer systems, one newer and one older, on a cycle of regular cleaning and inspection,

the vast majority of it performed in-house. One case in point: in recent years, SSO frequency has been cut from about 20 per year to 10.

Increasingly, the county relies on technology to map its infrastructure, track maintenance progress, and even generate work orders for the maintenance crews.

Tight quarters

Pinellas County, on the Gulf Coast of Florida, has within its 280 square miles a population of 930,000, larger than that of Wyoming, Montana, Delaware, South Dakota, Alaska, North Dakota or



PROFILE:
Pinellas County
(Fla.) Utilities
General Maintenance
Department

SERVICE AREA:
280 square miles

POPULATION:
930,000

INFRASTRUCTURE:
1,148 miles of sewer mains;
300 lift stations; 2,000 miles
of water mains

ANNUAL BUDGET:
\$16 million

WEBSITE:
[www.pinellascounty.org/
utilities](http://www.pinellascounty.org/utilities)



A video inspection reveals root intrusion at a sewer pipe joint. Roots are among maintenance issues Pinellas County crews face regularly.

Vermont. It includes the major metropolitan areas of Tarpon Springs, St. Petersburg and Clearwater, the county seat. The county's name comes from the Spanish *Punta Piñal* — Piney Point.

Like much of Florida, the county faces limited potable water resources and, being on the Gulf, must deal with intrusion of salt-water into aquifers. Not surprisingly, the county has an extensive water reclamation system (see sidebar) in addition to providing drinking water and sewer service.

The underground and related sewer infrastructure includes 1,148 miles of sewer mains, 300 lift stations and 350 air release valves. The water system includes 2,000 miles of water mains and about 34,000 backflow preventers, and the reclaimed water system has 438 miles of piping. All that infrastructure keeps General Maintenance busy.

The water infrastructure is relatively new, averaging, by Bollen-



Members of the Pinellas County crew include, from left, Johnny Parker, utilities specialist 3; Darrell Miller, crew chief; Steve Griffith, utilities specialist 1; and Jeff Gallo, utilities specialist 2.

bacher's estimate, about 30 years in age. The department has completed a campaign to replace galvanized piping, which had been the source of most leaks and repair issues. So now, water system maintenance is largely routine.

Doing more in-house

General Maintenance works in concert with the operations department, which takes care of essentially all electrical and mechanical equipment in the system and directs the Pinellas County Utilities fats, oils and grease (FOG) control initiatives.

“We’d been splitting about 50/50 on contract work versus in-house. The last time we did a price study, we found we could save on costs by doing a lot more of the routine work ourselves.”

Alan Bollenbacher



A video camera is deployed and ready for an inspection.

RECYCLING THE RESOURCE

Pinellas County processes 27 million gallons of reclaimed water each day. It is one of the largest such systems in the world, with 23,600 customers, 438 miles of pipe and 4,000 valves. And it was one of the first to be built in the United States.

The motivation, of course, is conservation of a valuable resource. But in Florida, there are other issues. The shallow water table and insatiable demand for potable water have created sinkholes in some areas of the state.

The county takes special precautions with reclaimed water to prevent

cross-connections with the potable water system, and also monitors the use of reclaimed water separately from potable water.

The county's website, which includes Utilities, won the coveted Sunny Award from Sunshine Review, a nonprofit organization that promotes disclosure of government information online. The site provides a wealth of information about how best to use reclaimed water and provides advice on low-water-demand plants for landscaping and optimized irrigation schedules.

Florida's economy is healthier than in many states, but PCU has had to adapt to budget reductions. "We'd been splitting about 50/50 on contract work versus in-house," says Bollenbacher. "The last time we did a price study, we found we could save on costs by doing a lot more of the routine work ourselves."

The next task may be to move the cleaning of the system's largest pipes, up to 42 inches, in-house. As of late summer, Bollenbacher's department was doing a cost comparison on in-house versus contract maintenance of those lines.

"We were working on a six-year maintenance cycle," Bollenbacher says. "Due to budget cuts that came with the downturn, we're extending that out to about eight or nine years, and we're probably looking at doing 90 percent of that work in-house."

Anderson Mitchell heads inspection operations, overseeing crew chiefs Chad Madonia, Darrell Miller and Robert Driemel. "We're just about into our fourth year on this process, and we're gaining some history," says Madonia. "After we complete this first cycle, we'll have a better idea how to target different areas. Some areas may require a 10-year cycle, others a 5-year cycle. So when we say eight to nine years, that's more or less an average."

Along the way, the department has downsized certain portions of its fleet. For example, instead of having one trackhoe that reaches extra deep, one extra-large dump truck, or other equipment used only occasionally for specialized jobs, it's more economical to contract for or rent that equipment as needed.

Two systems

Pinellas County has seen substantial growth. Between 1970 and 2008, the population increased by 80 percent, though projections show that stabilizing in the next decade. As metropolitan areas merged, the county found itself with two totally separate sewer systems, each with its own wastewater treatment plant.

"The southern system is the older part, with infrastructure close to 60 years old," says Bollenbacher. "The northern part is newer, and we don't have as many repairs up there. It was engineered and laid



Utilities specialist 2 Jeff Gallo (right) pulls out high-pressure hose while utilities specialist 1 Steve Griffith monitors the vacuum tube.

"We're just about into our fourth year on this process, and we're gaining some history. After we complete this first cycle, we'll have a better idea how to target different areas."

Chad Madonia

out differently, and it's a lot more efficient."

The sewer cleaning and inspection fleet includes one Vactor truck and four Aquatech (Hi-Vac Corp.) combination trucks; three CUES camera vans running Granite XP survey software and OZII and OZIII cameras; two Harben trailer-mounted jetters; and one walk-behind off-road jetting machine used for cleaning on backyard easements. A fourth camera van supports cured-in-place pipe (CIPP) lining operations.

Sewer cleaning and inspection crews work in coordination so that lines are cleaned by a combination unit and then inspected minutes later. Typically, a crew consists of two team members on a combination truck and two in a TV van.

"The cleaning team is out ahead of us, inspecting the manholes and jetting the lines, and we're following through with the TV camera," says Madonia.

One benefit of close coordination is that if the TV crew sees a deposit or other obstacle in a cleaned pipe, they can easily call the cleaning truck to come back

and jet the line again. Another is that TV crews are always seeing freshly cleaned lines in which they can easily spot defects.

Priorities for cleaning and inspection are determined by factors such as lift station pump run times, history of stoppages, proximity to wetlands or other potential sources of inflow and infiltration (I&I), and problem areas such as sections with many food-service establishments known as hotspots for grease.

Seeking efficiency

The maintenance crews have become highly efficient, according to Garry Dennis, department repair and maintenance manager. "We're on track to clean about 60,000 feet per month," he says. "The most we've cleaned in a month was 84,000 feet. That was in March. It was 31 days, nothing broke down, and everybody was at work."

New equipment helps keep efficiency levels up. The department replaces equipment on roughly a five-year cycle and designates the newest vehicles for the highest production. Smart deploy-



A root cutter tool being removed from a sewer line.

ment also ensures high equipment utilization. For example, two of the three combination trucks focus full-time on routine line cleaning. The third splits time between routine cleaning and first-response calls for sanitary sewer overflows and other events.

The Vactor and Aquatech cleaning trucks each have design differences that are beneficial in certain situations. For example, Madonia notes that the rear-mounted hose reel on the Aquatech trucks provides a quieter work environment and enables better

(continued)



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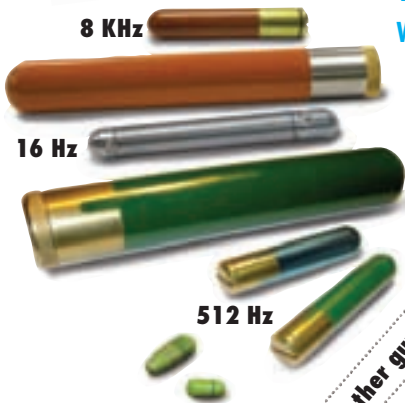
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communication for crews working in concert with TV inspection.

The Vector trucks, on the other hand, have front-mounted hose reels with their own set of advantages. "If you're on a busy street, because the back of the truck is facing traffic, now you've got the crew in front, and that makes the truck itself an additional safety barrier," says Dennis. "So both designs have their place, and it's nice to have that choice."

For inspections, PCU uses NASSCO's PACP defect codes. "It's becoming the industry standard, so it helps in dealing with our contractors when everyone's talking the same language," Bollenbacher says. Inspection data is stored on hard drives and downloaded to a central server daily.

Fixing problem areas

Where possible, PCU uses CIPP lining for repair. Shorter segments, generally 40 feet or less, are done in-house with Perma-Liner technology. Longer manhole-to-manhole runs, up to 400 feet, are turned over to the engineering department for contracting.

"Probably 70 percent of repairs are open-trench, because most of them involve just one small piece, for a belly or crack in a pipe, or for root intrusion," says Dennis. Manhole repairs are contracted out for lining with SpectraShield polymer resin.

Crews attack root intrusion with the combination trucks, using nozzles that include a chain flail from Shamrock Pipe Tools and a root saw from Cloverleaf Tool.

Another maintenance initiative is the pigging of sewer force-mains. Pigging scours the interior pipe surfaces and reduces flow resistance. It's a specialized service that the department delegates to contractors.

PCU is also systematically replacing old and badly degraded air release valves at lift stations and at high points in the system with new stainless steel and brass units. The replacements have the effects of reducing head pressure, shortening pump run times, and increasing energy efficiency and service life.

Day to day

Regular scheduling and work

orders are handled by the Maximo system from IBM. It incorporates information about blockages, I&I, SSO history, component age, man-hours of labor, equipment cost and other data.

PCU has had a geographic information system (GIS) in place for about 20 years. "We've got our assets pretty well mapped," says Bollenbacher. "We started with the water side. Next we'll move to the sewer system. We're using survey-grade GPS equipment and locking in all that field data."

Even though the budget has decreased, judicious choices on in-house versus contracted work have allowed PCU to accomplish its mission. The condition of the older southern half of the system is gradually catching up to the newer northern half as deteriorated pipe is repaired or replaced. That reduces service calls and maintenance requirements and keeps customers happy.

"We're trying to be really proactive about things," says Bollenbacher, "and I think we're finally seeing the payoff." ♦

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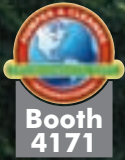
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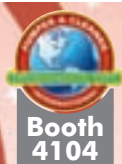
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FOCUS: STORM

STARTING FROM SCRATCH

The City of Tega Cay builds a sound stormwater management program with a secure funding source and makes progress toward proactive management

By Erik Gunn

How would you do things differently if you were building your municipal utility from the start?

The City of Tega Cay, S.C., had exactly that opportunity with stormwater management.

Regulatory changes required the city to get a formal permit for its stormwater utility just five years ago. It set up its first fee structure less than three years ago. The first stormwater ordinance was signed in March 2009. "So this is all relatively new to us," says Tim Gillette, who as stormwater manager must carry out the terms of that law.

Tega Cay is part of the fastest-growing area in York County, itself the fastest-growing county in the state. As the city booms, Gillette and other officials are learning on the fly what it takes to run a modern stormwater program that is friendly to the environment and to ratepayers.

You could say the city is building its operation from the ground up — or the ground down. It's done with careful planning and a heap of public education.

Young city

Located 20 miles southwest of

Charlotte, N.C., just over the state line, Tega Cay is a former gated community that hugs the shores of Lake Wylie and the Catawba River. The city was founded in 1984. The stormwater system consists of more than eight miles of pipe draining about six square miles and serving a population of 7,500. The system will grow to about 10 miles once some development projects are finished in the next three to five years.

Stormwater pipes range from 8 inches to 4 feet, most in the 16- to 24-inch range. They include older galvanized steel pipe, reinforced concrete, and newer high-density PVC. "We like the newer stuff better," says Gillette. "It lasts a good bit longer."

Until 2006, the stormwater collection system was basically unregulated — just a simple line item in the general fund budget. Starting that year, new EPA regulations required Tega Cay to obtain NPDES permits. With that it became clear that the community would have to find an alternative way of funding a program previously covered by regular property taxes.

Step One was an evaluation of the storm sewer program. For that,



Tega Cay operations director Charlie Funderburk (left) and stormwater manager Tim Gillette. (Photography by Donna Bise)



Pamphlets were mailed to all residents in Tega Cay, educating them on the stormwater management program.

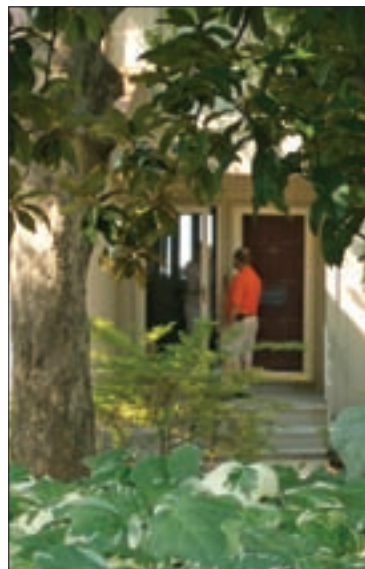
the city hired the international consulting firm AMEC, which has an office in Morrisville, N.C.

Two-level billing

AMEC evaluated Tega Cay's system and operation and helped the city set its first separate stormwater management budget, including a mechanism to pay for it. Several factors came into play. Because two separate water systems serve city residents — one municipal and one private — the stormwater charges couldn't simply be tacked on to the city's water bill. And York County, which collects property taxes for the city, declined to add it to the annual tax bills, says Charlie Funderburk, operations director for the city.

State law limits how much communities can raise taxes each year, based on the consumer price index and population growth. That ruled out simply adding the cost on to the property tax. "AMEC showed us that the most equitable way to fund this new program was to charge the customer based on what they were contributing in the way of impervious surface," Funderburk says. "Therefore we have a utility fee. That way the customers are paying their fair share."

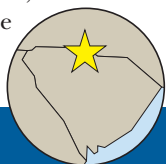
The city settled on a two-tier payment plan. Residential property owners pay a flat fee of \$96 a



year — \$8 a month billed annually. "Otherwise, that \$8 a month bill might end up being \$15 a month, or more, to cover postage, billing, receivables, payables, things like that," says Funderburk.

Commercial customers pay on the basis of an Equivalent Residential Unit (ERU). For Tega Cay, one ERU is 3,600 square feet of impervious surface on a commercial property. A property's total number of ERUs is multiplied by \$96 to derive its annual stormwater fee. Some commercial properties have 50 or more ERUs.

When people don't pay, late fees are added and, if necessary, the city takes delin-



PROFILE: City of Tega Cay, S.C., Stormwater Department

FOUNDED:
2006

POPULATION SERVED:
7,500

AREA SERVICED:
6 square miles

INFRASTRUCTURE:
8 miles of storm sewer lines

ANNUAL BUDGET:
\$369,000 (2011)

WEBSITE:
www.tegacaysc.org

Stormwater manager Tim Gillette informs a resident about an upcoming stormwater construction project that will affect the neighborhood.

quent payers to court. "Then that \$96 fee ends up costing them significantly more," says Funderburk. "And that's unfortunate. Everyone's battling the economy and hard times with layoffs and things like that. Tega Cay is not immune to that. But at the end of the day, we have mandates that we have to meet as stipulated by the state and the EPA. We've tried to work with folks that have contacted us. Requiring residents to pay late fees and in some cases court costs on top of that is not an ideal situation by any means."

Educating the public

AMEC's report was important not just to help the city decide how much to charge for stormwater management, but to make the case to the people who would pay for it, and determine what needed to be done to be in compliance with mandates stipulated in the permit.

"We wanted to have hard data that showed not only us but residents and customers why the fee is what it is," Funderburk says. "And it's not just some arbitrary fee. If somebody did choose to fight it with

legal means, we had background data that shows this is scientifically how we arrived at this fee — it wasn't just some abstract number that we pulled out of thin air. We need to be able to show that this is what it will cost us to have a compliant storm sewer system that addresses every mandate."

Education was important early on. "A lot of people were confusing storm sewers with their sanitary sewer, with their water bills, things like that," Funderburk says. "We did get a lot of questions."

The education paid off. Unlike water or electricity, there is no way to cut off stormwater service for lack of payment. "Our consultant told us to expect probably a 92 percent collection rate," Funderburk says. "In our first year, we achieved right at 97 percent," even though there was still some public objection.

How did Tega Cay do so well? Funderburk credits a lot of meetings, many with a consulting firm representative, well before even the first bill went out. There were pamphlets to each home and business, question-and-answer sessions, and a prominent Frequently Asked Questions (FAQs) page on the city's website that grew as city officials logged repeated questions from citizen callers.

MANY HATS

Because Tega Cay is a small community, everyone who works for the city wears many hats. Take Tim Gillette, stormwater manager. "Tim is also the city horticulturalist, our IT guy, and our safety and risk coordinator," says operations manager Charlie Funderburk.

The same is true for public works employees. "One day they're patching potholes, the next day they're replacing a storm drain, and the next day they're mowing a ballfield," Funderburk says.

Already, four city employees have qualified as Certified Erosion Prevention and Sediment Control Inspectors (CEPSCI), and Gillette and Funderburk consider hands-on training as a big part of their jobs. "As we're doing projects, we explain to the guys that this is what we need to do, this is why we need to do it, and this is what's causing this," Funderburk says. But more formal training is a growing part of the budget.

"We've got some folks on staff who, while they may not be CEPSCI-certified, or they might not have a whole lot of stormwater experience, they do have a lot of pipe experience with water and sewer," Funderburk says. Altogether, the city devotes about 3 FTEs to its stormwater program, but that's spread among seven or eight employees.

The city has also promoted monthly stormwater tips on the Web to advise residents what they should and shouldn't do that can affect the stormwater flow. "We are also very fortunate to have a large number of residents who are environmentally conscious and understand the importance of this utility," Funderburk adds.

Building awareness

"Most people when they think of stormwater, they think of massive pipes with tons and tons of water flowing through them," Gillette says. "But they don't think about their grass clippings that they blow out into the street getting into the storm sewer system, washing out their paint brush over a street drain, or having unmulched or unvegetated areas of their yard and dirt running out into the street drain. They weren't geared to think, 'Oh that's affecting stormwater.'"

Now the city is ramping up its education by expanding public participation. "We're partnering with the local school district to get information to students at the elementary and middle-school level in science classes," Gillette says. Boy Scouts are enlisted to stencil warnings on street drains to keep people from dumping toxic materials like paint. And an annual river sweep encourages people to clean litter out from around the watercourses and keep it out of storm drains.

Education also extends to teaching developers how to build and landscape to maintain the integrity of the land and prevent erosion, which can clog storm lines and waterways over time.

From reactive to proactive

As stormwater manager, Gillette meets monthly with the city's stormwater committee. "One of the key objectives right now is updating the goals of our Minimal Control Measures (MCMs) as part of our stormwater management plan," says Gillette. "The new NPDES permit is still in draft phase, but once it comes out, there are potentially a host of new regulations that the city will have to address, and pretty quickly."

Maintenance now tends to focus on immediate and urgent matters, as when a resident complains of a



A stormwater department crew digs a trench between two ponds on the Tega Cay golf course to remedy a poor drainage system.

sinkhole in the backyard, a stormwater discharge pipe flooding a property, or a clogged catch basin. The response in turn requires evaluating what needs to be done to fix the situation. It may also involve teaching property owners not to do such things as covering a stormwater outfall.

Typically, the city has identified 12 to 15 major stormwater-related capital projects at any one time. Many of those involve repairing inlets or reworking outfalls. In

rent one, or we contract it to come in," Funderburk says.

A few years ago employees mapped the stormwater system over a 2 1/2-month period simply by walking around with GPS units, identifying outlets and inlets, and recording their findings in a CAD file integrated with York County's GIS to make a map.

"We haven't yet gotten into smoke testing or dye to trace things, but we probably will over the next couple of years so that we can cap-



Tim Gillette and Charlie Funderburk look over golf course plans and discuss options for fixing a poor drainage system.

"Being new to this, a good bit of what we do is reactionary. A problem has presented itself, let's remedy the problem. We're just now starting to develop a capital improvement program and starting to forecast projects for the future."

Charlie Funderburk

other cases, the staff is replacing old lines that have become corroded or otherwise damaged. For now the city primarily uses open-cut methods, but there is interest in exploring trenchless methods, such as cured-in-place lining.

Keeping it simple

Many of the city's methods are basic. Equipment is shared, from the city's backhoe to the DinkMar Curb Runner trailer vacuum unit typically towed behind a light-duty Ford F450 dump truck to collect loose leaves from gutters to keep them out of the stormwater lines. The city has no jettors, no TV cameras and no combination trucks — not yet, anyway. When the service is needed, "We just

ture the remainder of the inventory," Funderburk says. And when newly developed areas are added to the city, developers are now required to provide a digital map of the stormwater system that can be added to the city's file.

Bit by bit, the information is becoming more complete. Gillette, for instance, has identified every stormwater line that crosses under a road in the city. "We feel like those need to be our number one concern, especially in the older sections of town where we've got galvanized steel pipe that may have rusted," says Gillette. "We don't want to end up running into road failure or something like that."

While the city is building its knowledge and systems, it strives

to take the longer view. "Being new to this, a good bit of what we do is reactionary," Funderburk says. "A problem has presented itself, let's remedy the problem. We're just now starting to develop a capital improvement program and starting to forecast projects for the future. We're trying to become more proactive.

"Hopefully, over the next year to three years, we'll get to the point where we've identified future problems and get those targeted on a list to remedy before they become serious." So as Tega Cay keeps its eye on the future, it has made good use of the fresh start. It's a start that helps ensure that future will be built on solid ground. ♦

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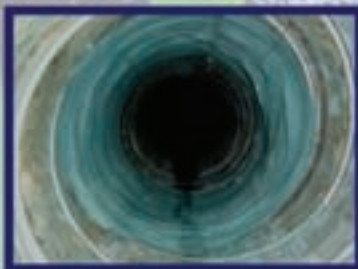


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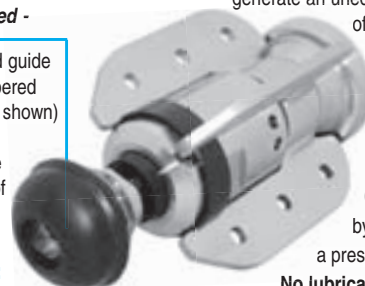
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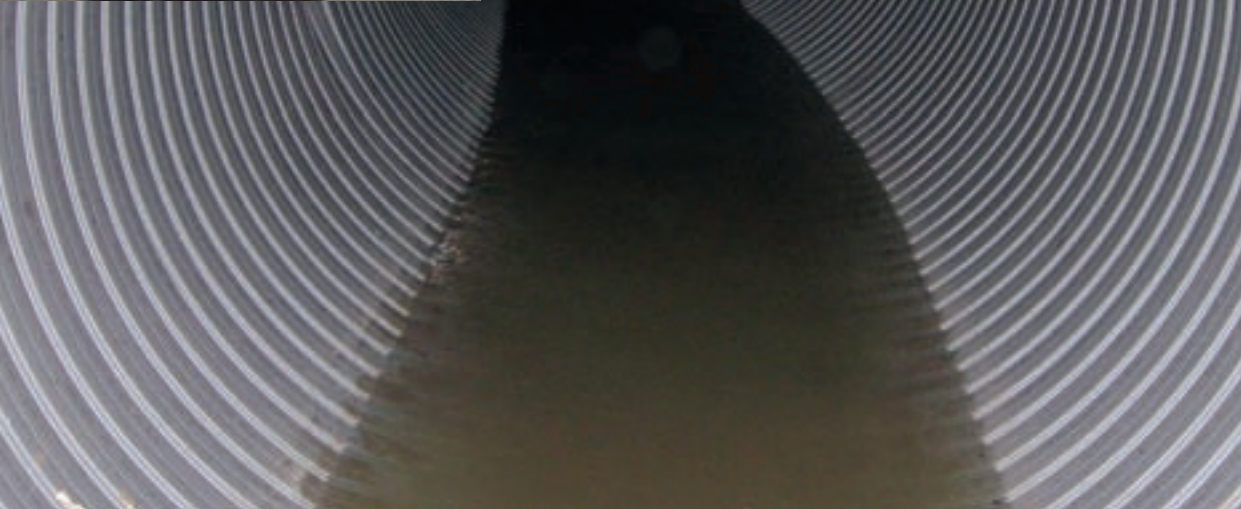


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The 78-inch pipe after renewal with the SPR system, and before (inset). (Photos courtesy of Sekisui SPR Americas)

“This installation has been successful at least in its initial phase, and if the long-term results are as good as we suspect they will be, the Sekisui process has great prospects for future use.”

Mike Flanders

FIRST TIME IS THE CHARM

A spiral-wound structural lining system lets the Cincinnati sewer district repair a 78-inch pipe under a manufacturing plant with no flow interruption

By Jonathan Vaccaro

The Metropolitan Sewer District of Greater Cincinnati needed to repair a rusty, weak and deformed section of 78-inch corrugated metal combined sanitary-storm sewer pipe running under a pharmaceutical company drug research and manufacturing site.

The size of the pipe and its location under an active industrial plant presented unique challenges for MSD senior engineers as they reviewed rehabilitation options.

The addition of a second story to the drug company building required a structural solution. Man-hole access was next to an active

multiple-entry loading dock on one side and next to railroad tracks on the other. In addition, the pipe was laid on a curve and had several active service connections.

The district solved the problem by using the Sekisui SPR spiral-wound pipe renewal system, which enabled the repair to be completed without bypassing the pipe.

No flow interruption

The pipe location precluded bypassing the active flow because routing of the bypass pipe would have affected the company's loading dock operations. There was also the risk of a rapid flow increase

in case of rain, and district officials found the cost of bypass pumping to be excessive.

Seeing that a standard solution was not feasible, the district staff explored the Sekisui spiral-wound technology, which had never been used before in Cincinnati. They determined that the technology would provide structural renewal without bypassing and would negotiate the curved pipeline. It would also enable reconnection of active service laterals, accommodate daily flow, and provide safe conditions for the installation crew.

The staff found the Sekisui process simple and straightforward.

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USER:

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Cleaning revealed that the interior of corrugated pipe had significant rusting in the invert, including holes through to the surrounding soil. This meant the pipe was structurally compromised and that continual high-to-low-flow conditions would allow scouring of the external soil, weakening support and ultimately resulting in a structural failure under the factory floor.

Getting it done

After the pipe was cleaned, workers lowered a purpose-designed hydraulically powered winding machine loaded with the SPR PVC profile material into the sewer while it was still in service. A roller interlocking mechanism automat-

ically rotated around the pipe walls, progressively winding the lightweight, corrosion-resistant material to create a new pipe inside the old.

The T-shaped rib profile material, with steel reinforcement, securely locked into place, forming a strong and durable new pipe. On completion of spiral winding, new pipe bulkheads were constructed at each end, and the service connections were joined.

Next, workers injected a high-strength cementitious grout into the annular space between the SPR pipe and the CMP host pipe walls. The SPR pipe was supported during grouting with a temporary internal bracing system, designed to prevent pipe flotation and to maintain the desired new pipe shape.

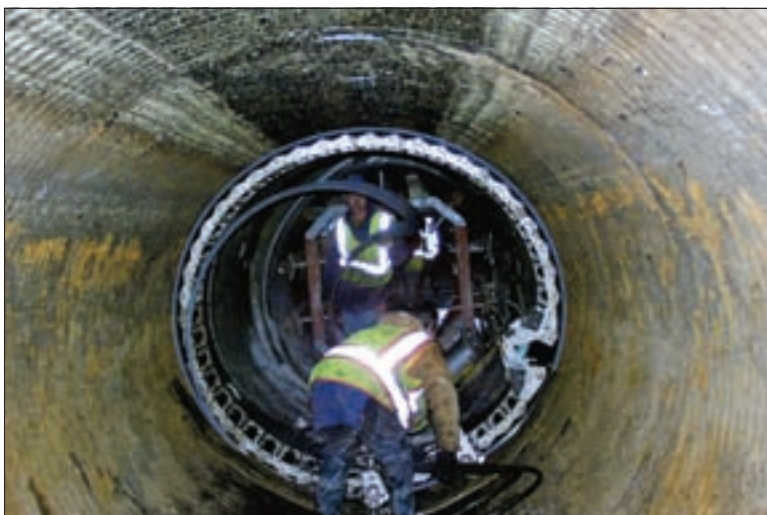
Efficient and cost-effective

The district repaired 105 feet of aged CMP combined sewer pipe in two weeks from start to finish with no disruption of service and with no inconvenience to the pharmaceutical plant. Because the installation was efficient and cost-effective, the district is considering it for future sewer rehabilitation jobs.

“This installation has been successful at least in its initial phase, and if the long-term results are as good as we suspect they will be, the Sekisui process has great prospects for future use,” said Mike Flanders, senior engineer with MSD. ♦



Metropolitan Sewer District employees feed SPR material through a manhole to the self-propelled spiral winding machine.



Crew members inside the pipe work on the lining installation.

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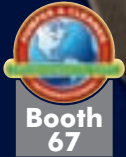
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SINGLE SOURCE

The M-Series system from Rausch Electronics accommodates multiple inspection and other tools on a single tractor, controller and software package

By Gil Longwell

Inspection, cleaning and repairs for mainline and lateral pipes traditionally call for different equipment sets. Each task also requires its own supporting control and data acquisition systems. Rausch Electronics USA now offers a simpler way.

The company's M-Series (M stands for modular) system can deploy a variety of specialized inspection, cleaning, testing, measuring and repair tools from a single tractor platform. Using one tractor and a variety of task-focused modules reduces hardware cost.

In addition, cross-task control systems and data management software eliminate the need to train operators on disparate systems, and free operators from having to reacclimate themselves to the controls as they move from task to task.

Rausch Electronics operator Jordan Newcomer and president Rudy Ellgass demonstrated the M-Series and its varied capabilities in the company facility near Chambersburg, Pa. Then, on a cold blustery December day, they deployed the system from a demonstration truck into sewer lines in Greene Township Municipal Authority in Greene Village, Pa.

Walk-around

The Rausch L135 four-wheel



Resting on its transport rack, the unit gets a final lights check before insertion to the manhole. (Photography by Gil Longwell)

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DEMONSTRATED BY:
Jordan Newcomer, operator, and Rudy Ellgass, president, Rausch Electronics USA

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steerable tractor is the main platform for all combinations of M-Series modules. Each module is configured for mounting onto and being operated in concert with the tractor, which can support any of three cameras and associated luminaries, as well as other task-expanding modules.

The tractor's boom is more than a module mounting point. Attached near the rear of the tractor, the boom positions the module in front of the tractor and is used to elevate the centerline of every module attached to it. Changing tire diameter can further elevate the boom, enabling the M-Series to work effectively in pipes from 6 to 60 inches. Stacking tires widens the tractor's stance and adds stability for better footing in wider pipes. Stacking is achieved by adding tires on the outboard sides of already-mounted tires.

The most basic configuration is the L135 tractor with a camera

attached directly to the boom. This combination is used only for mainline inspections. Whether configured for mainline or lateral inspection, the first module is attached to the tractor's boom. Each additional device is attached to the front of the last-connected module.



Nitrogen is added to the Feed Module during its pre-trip inspection.



The lateral camera fits in the palm of the hand.



Rausch Electronics operator Jordan Newcomer uses the foot control to operate the power as he introduces the system into a manhole.

The tractor's auto-steer function is controlled by an inclinometer, keeping the tractor at the pipe's bottom dead center (BDC). If the system recognizes that the machine is tracking uphill (up the side of the pipe), it repositions the tractor at BDC. The operator can manually steer the tractor. As it moves through each traverse, information from another inclinometer senses, and the computer records, the pipe's grade.

When the assignment includes both mainline and lateral inspection, the configuration is changed. The SKM135 Feed Module is attached to the boom. Atop the Feed Module, a series of motor-driven wheels grasp the lateral push camera's control cable and either push the camera into or retrieve it from a lateral. The operator can use this module's built-in nondirectional, forward-looking camera to watch the action on a display screen at the control station. The configuration can inspect laterals up to 100 feet long.

As the Feed Module manages the camera's forward/backward movement, it relies on the PM135



All controls are in close proximity in the operator compartment.

Positioning Module to manage the direction toward which the camera will be pushed. This module is mounted on the front end of the Feed Module.

The Positioning Module's rotation and pan range enable introduction of a KS60CL lateral camera into a lateral at any point on the mainline pipe's circumference. A rigid steering pin resem-

support vehicle. A radio sonde for locating purposes and auxiliary light attachments are available as options.

The KS135 camera is primarily for inspections in mainlines from 6 to 60 inches. The KS135 Scan camera inspects mainlines up to 48 inches. This camera has a pair of embedded laser lights which, with the proper software, enable

The company's M-Series system can deploy a variety of specialized inspection, cleaning, testing, measuring and repair tools from a single tractor platform. Using one tractor and a variety of task-focused modules reduces hardware cost.

bling a cat's whisker can be attached to the camera to help the operator introduce the lateral camera into the lateral opening. The coordinated action of the Feed and Positioning modules guides and pushes the camera.

Three camera modules are available, and the operator selects the one that best suits the task. All camera modules have pan-and-tilt capability, software-enabled self-righting imagery, and integral LED illumination. They all use the camlock and integrated spring-loaded electrical contact system. All rely on a dedicated power/control/data cable to send the imagery to the computer in the

instant analysis of pipe deformity (out of round). The lasers are also used to measure defects, all captured on the onboard computer. The KS135 and the KS135 Scan cameras have 10X optical and 12X digital zoom capability.

The KS60CL camera, which easily fits in a 4-inch pipe, is primarily for lateral inspection but can do double duty as a mainline camera.

Additional modules add to the M-Series' versatility. For cases where debris is encountered in a pipe, the Feed Module can be converted to transport and operate the TSS150 kit, which allows attachment of a pressurized jetter in the position usually occupied by the

KS60CL camera. The jetter and its supply hose must be supported either by a separate truck or by equipment provided by a third party. The same Rausch control module is used to introduce the jetting module into a lateral. The operator monitors the action through the forward-looking camera on the Positioning Module.

A variety of modules are available for pressure testing pipe segments from 6 to 24 inches in diameter at individual joints, or for segments up to 15 feet long. Modules also can enable spot repairs for pipes ranging from 6 to 32 inches, although that process requires one or more of the components used for inspection and a separate source of compressed air.

Operation

The M-Series components were supported by a demonstration truck equipped with a climate-controlled operator's cabin that housed a rough-duty protected computer with



In this simulation, two red lasers are used to conduct out-of-round analysis of a pipe's entire length. During the analysis, the head of the KS135 Scan camera rotates continuously as the tractor moves through the pipe. These same lasers are used to directly measure individual defects.

equipment control and data recording systems and POSM pipe survey software (RS Technical Services).

The computer had an Intel Core i5 CPU operating at 3.33 GHz. Three GB of RAM were installed along

with a 160 GB hard drive. The console and a computer monitor focused the operator's attention in a compact ergonomically friendly workspace.

Deployment and support equipment were housed in an open-air section where a modest workbench, tool rack and storage spaces were installed. An onboard Cummins Onan 5 kW generator, the smallest capacity Rausch will install, powered all onboard electrical equipment.

The L135 tractor was stored in a slide-out tray directly under the deployed crane-like arm and winch system that introduced and retrieved the modular system. Additional storage spaces held a variety of tire sets, various other

“Buried conveyance systems that carry sewage or potable water, or exhibit hazardous environments, are all settings the M-Series is suited to inspect and maintain.”

Rudy Ellgass

modules, and supplies and tools.

The demonstration began on the workbench in the rear of the company's demonstration van in the Rausch facility. There, Newcomer configured various modules to conduct pre-deployment inspections. He also checked the pressure level of the nitrogen used to prevent liquid intrusion into the tractor and every module.

As Newcomer changed from

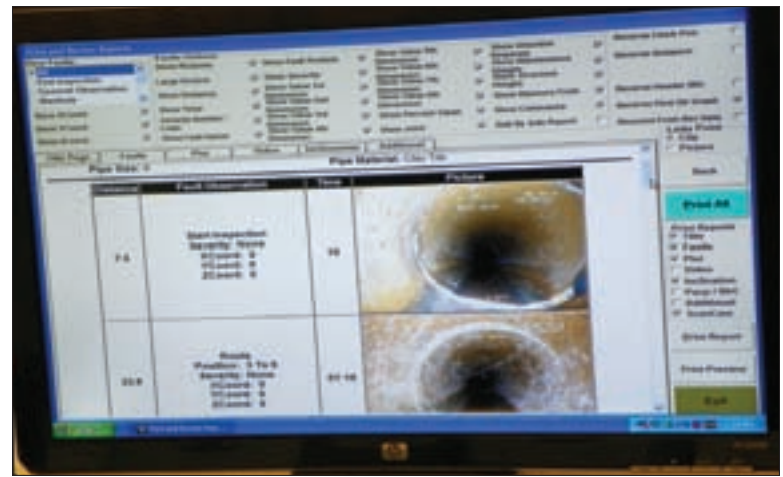
module to module, each change illustrated the quick-connect and quick-release capabilities of the modular design. Each component became a semipermanent addition to the component to which it was mounted.

Physical connections were achieved by a watertight, double camlock fitting. Within the body of the fitting were a series of spring-loaded electrical contactors that transfer information, control commands, video signals or energy to each component. Ellgass explained that the spring-loaded contactors maintain circuit continuity while eliminating the potential for failure inherent in friction (spade-and-post or male-female pin) contacts.

When Newcomer was satisfied that each component was ready for use, he assembled the tractor, Feed and Positioning modules and a KS60CL camera into a dual-purpose unit, which he stowed in and secured to its transport rack. The demonstration then moved to the field.

There, after traffic control cones were deployed, Newcomer put the configured system through a final lights check and deployed it into an 8-inch sewer. Inspection proceeded up the line, gathering general data and a continuous video file. Because the line was less than two years old, no defects were observed. At various points, Newcomer stopped the tractor and demonstrated its pan-and-tilt capabilities.

On the return, which was sim-



After an inspection traverse is completed, the operator can use POSM software to review each defect.



Spring-loaded contactors (gold) are housed within the waterproof double-camlock connectors.

plified and accelerated by the automatic synchronization of cable retrieval and the tractor's reverse movement, Newcomer inspected laterals as the tractor reached them. Using the control systems at the workstation, Newcomer positioned the tractor, then switched to active control of the Positioning Module and Feed Unit. By turning the camera toward the lateral and combining rotation with incremental deployment moves, he easily introduced the lateral camera to pipe.

As the camera moved toward the house, the POSM data and image-capture systems created and then preserved a record of the inspection. Retrieving the camera was uneventful. When the tractor returned to its neutral (forward-looking) position, retrieval continued until the next lateral connection. At the end of the traverse, Newcomer retrieved the tractor using a specialized hook that slipped under two docking pins on the tractor.

All that remained was tractor cleanup and stowing. If Newcomer had encountered defects, he would have entered their location, type and severity into the computer's data-capture system, coordinating the data and imagery with their precise location.

Observer comments

The dual-purpose, quick connecting camlock lived up to its name. It took minimal handwork to configure and connect modules, using only T-handled Allen wrenches.

The operator workstation was spartan, functional and comfort-

able, despite the windy 25-degree day. A bulkhead window gave the operator direct visual observation of the work area. A down-looking camera over the manhole enabled additional surveillance of the work area.

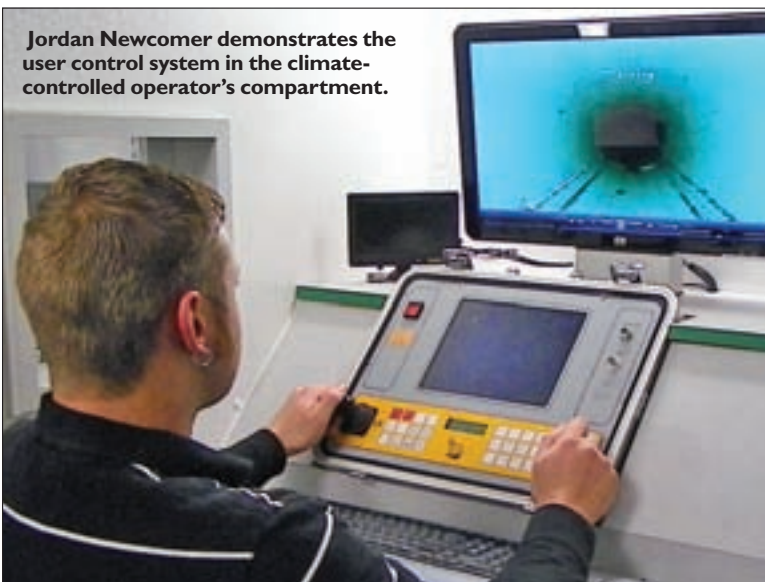
Every M-Series module is available in an EX version, certified for use in potentially explosive environments found in pipe systems like those in a leachate collection system at a landfill. The entire inspection process was paperless.

Manufacturer comments

“Buried conveyance systems that carry sewage or potable water, or exhibit hazardous environments, are all settings the M-Series is suited to inspect and maintain,” said Ellgass.

He noted that modularity brings diversity and adaptability to the equipment and reduces operator training, as the software and control systems are the same.

“Every core component is built in Germany, and each is maintained and serviced in our location in Chambersburg, Pa.,” Ellgass added. “Operator training is provided at that location, or at the buyers' locations, using the equipment they have purchased.” ♦



Jordan Newcomer demonstrates the user control system in the climate-controlled operator's compartment.

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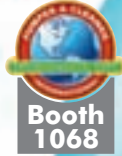


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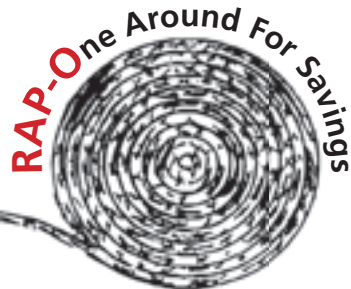
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STAYING ON TRACK

A few simple skills can help employees avoid distractions and keep their focus on the organization's biggest priorities

By Ken Wysocky

As saying goes that it's hard to remember you came to drain the swamp when you're up to your neck in alligators. That rings true in today's public sector.

So what's the solution? Time-management and productivity consultant Cynthia Kyriazis suggests an approach that essentially centers on three words: Just say no.

That includes resisting the urge to constantly check e-mail, breaking the habit of keeping a messy desk or a cluttered truck, politely declining to talk between sewer inspection runs about a colleague's impending divorce, or overriding your ego and asking a supervisor to help you set priorities when you're overwhelmed.

"Setting priorities is one of the key components of successful time management," says Kyriazis of Productivity Partners Inc. in Overland Park, Kan. "As author Stephen Covey says, the main thing to remember is keep the main thing the main thing."

Staying focused sounds simple, but staying the course in the face of distractions is hard. On the other hand, most employees can step back and pinpoint cases where they could be more disciplined.

Obstacles abound

Almost anyone — middle managers, field supervisors or line workers — are beset by "alligators." A prime culprit is technology, which is supposed to improve productivity.

For instance, smart phones give supervisors access to technologies like GIS maps and GPS data, but they also provide e-mail access

anywhere — a blessing and a curse.

"A BlackBerry allows you to check e-mail more frequently and not have hundreds of unread messages in your mailbox," Kyriazis notes. "But it also eats up focus. You have to remember it's just a tool. As long as you can manage the tool, and the tool doesn't manage you, you're in good shape."

The same is true with change and shifting priorities, which occur more and more often and can leave employees bewildered. Change is important — organizations need to move quickly and react to shifting conditions.

"Everybody gets that intellectually, but there often seems to be a disconnect between the people ordering the changes and what it does to the people who need to make them," Kyriazis says. "New strategic plans, for example, must be measurable and time-lined so that everyone knows what's expected of them, by when, and what resources to use. Without that guidance, there's no clear priority, so everything becomes a priority."

Get focused

So what are line workers or supervisors to do? They can start by consistently establishing a Plan B for times when alligators start nipping unexpectedly. For example, if a report is due in a week about backflow testing results, and you plan to finish it this Wednesday, also block out another later time, just in case you're derailed.

"Plenty of managers tell me they only plan week to week in terms of time management and prioritization," Kyriazis says. "They

don't have any problem blocking out time for something, but they rarely plan on when they'll do it if they can't get to it during the time they blocked out. Plan B can't be, 'Gosh, I didn't get to it.'

"Without a Plan B, the inclination is to get the work done after hours or on weekends. But once you start to do that, it becomes a habit, you get stressed out and disengaged, and work/life balance doesn't exist. Your spouse gets angry and your kids wonder where you

"Sometimes we intentionally give in to distractions because they're more fun or we're anxious about the task at hand. But every time you do that, you break the focus on what you should be doing. If you're checking e-mail every 20 minutes, you're only exacerbating the situation."

Cynthia Kyriazis

are all the time. If you don't make time to do things you personally enjoy, that boosts your stress level and impairs your productivity."

It's also critical to determine the things that distract you from doing what you should be doing. These factors can be internal, such as a cluttered desk or a messy service vehicle, or answering the phone while you're intently working on a project, instead of letting calls go to voice mail.

"Sometimes we intentionally give in to distractions because they're more fun or we're anxious about the task at hand," Kyriazis observes. "But every time you do that, you break the focus on what you should be doing. If you're checking e-mail every 20 minutes, you're only exacerbating the situation."

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 Ted Rulseh at 800/257-7222, or e-mail editor@mswmag.com.

Managing peer pressure

Other distractions are external, like day-to-day interruptions by peers. A colleague leans into your truck's window as you prepare to head for the next job site and wants to talk about fantasy football or a personal problem.

"Many people don't know how to say no, or believe it's not their job to say no," Kyriazis says. "But

all they need to learn is how to say it gracefully. You can acknowledge that you want to help, but explain that you're under time pressure and it would be better to, say, come in a little earlier tomorrow morning and talk before you both start your shift.

"It's important to acknowledge their need, then explain your situation and offer an alternative. Most people will respond positively to that. Sure, some people just won't take no for an answer. But if it's not a life-and-death matter that can wait, you must honor your own priorities. Because once you give in, you've sabotaged yourself."

Another tactic for overwhelmed employees is to ask a supervisor to help you set priorities. People often

avoid this because they're afraid it makes them look incompetent in the eyes of their boss, but again it's what you say and how you say it that counts.

"If your boss says you need to switch gears and do something else, don't say, 'No, I can't do it right now because I'm so busy.'" Kyriazis says. "Ask for help with prioritizing. You may be afraid of looking incompetent, but what's worse? Missing a deadline on a project? Working all weekend?"

"It's important to put it in context. Tell your boss, 'I was working on A and B. Do you want me to put them on a shelf for a while?' It's simply a matter of explaining where you're at, not just saying you have too much to do. Don't throw up your hands and roll your eyes. Be specific. It's totally acceptable to ask for help if you're lost in the fray."

Relieving stress

Successful priority-setting strategies do more than make you more productive. They also help relieve stress, which helps you stay refreshed and be even more effective.

"Repeated tests and surveys show that if people are stressed out and disengaged, they just go through the motions and are far less productive than engaged employees," Kyriazis notes. "Stress is caused by the gap between what you're doing and what you should be doing. When you get them closer together, that gap doesn't exist." ♦

About the Author

Visit www.propartnersinc.com to learn more about Cynthia Kyriazis and her seminars and webinars about improving time management, productivity and organizational skills.

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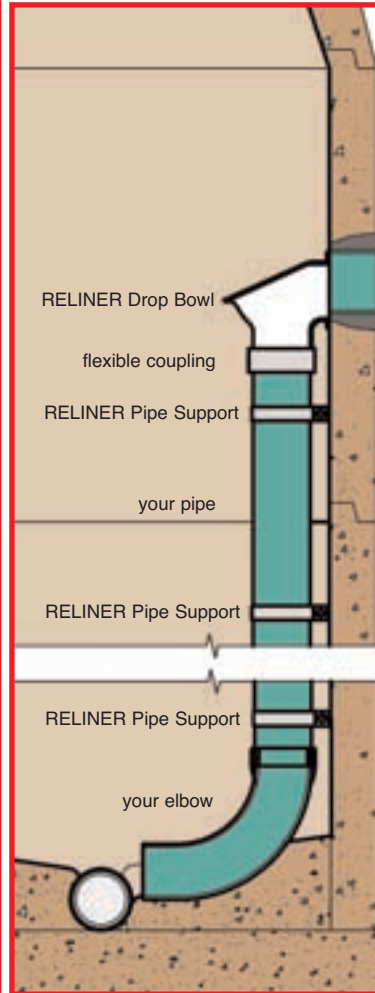
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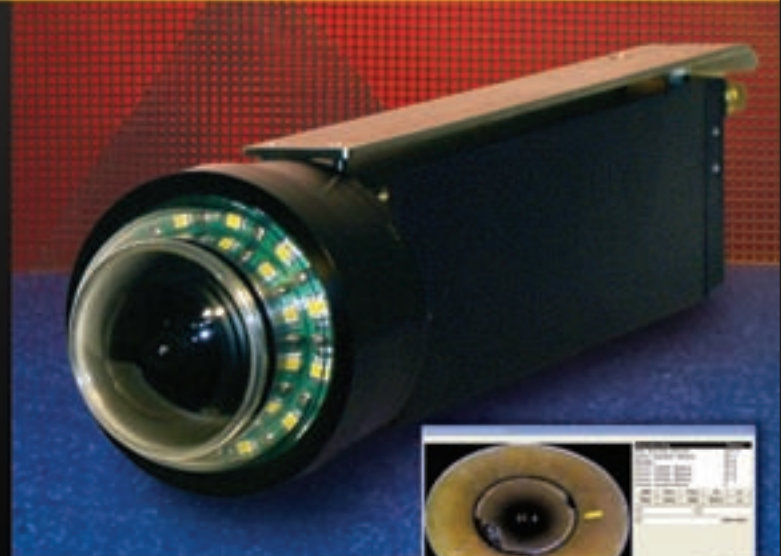
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Product Spotlight

High-Pressure Plugs Designed for Greater Flow Stoppage

By Ed Wodalski

High-performance inflatable rubber blocking plugs and pipe plugs with flow-through bypass from Savatech Corp. are designed for flow stopping, bypassing and pipe testing in pipes from 4 to 96 inches. Made of Kevlar-reinforced rubber, the heavy-duty pipe plugs are made to withstand greater backpressure than standard plugs.

Each plug is multi-sized to fit a range of pipe sizes. Bypass plugs can be re-sleeved if punctured. The plugs have deflated diameters of 3.6 inches (4- to 8-inch plug) to 37.8 inches (40- to 96-inch plug). Plugs measure 21 to 158 inches long and weigh 2.4 to 706 pounds. Larger plugs can be inflated in 5 to 10 minutes; smaller plugs in about a minute due to high-flow, quick-connect air couplers.

Inflation pressure ranges from 45 psi in the smallest plugs to 15 psi in the largest. "Forty-five psi in a 48-inch inflatable rubber pipe plug will hold back 32 feet of water head pressure," says Jim Jaeger, operations manager. "That's more than 27,000 pounds of force."

To protect against over-inflation, each plug (up to 48 inches) has a three-times safety factor. "If the inflation pressure is 45 psi, the minimum burst pressure inside a pipe would be three times that, or 135 psi," Jaeger says. The larger plugs have an industry-standard two-times safety factor.

Plug life depends on frequency of use and level of exposure to corrosive environments. Maintenance, such as cleaning with soap and water after each use and storage away from sunlight, can extend service life. **386/760-0706; www.savatech.com.**



Plugs from Savatech Corp.

Red Valve Offers CheckMate Inline Check Valve

The CheckMate inline check valve from Red Valve Co. is designed for backflow prevention and odor mitigation. The all-rubber, maintenance-free valves are available in 4- to 72-inch sizes. **412/279-0044; www.redvalve.com.**



Vacall Introduces AllJetVac with Rear-Mounted Reel

The AllJetVac with rear-mounted hose reel from Vacall Industries is designed for sewer cleaners who prefer the hose located away from the engine. The combination cleaner has a heavy-duty tailgate with vault-style latches and dual cylinder lift system for optimized rear-seal performance. Other features include low-profile design for reduced overhead clearance of 11 1/2 feet. **800/382-8302; www.vacallindustries.com.**

RIDGID Introduces Contractor-Grade Laptops

Rugged, contractor-grade laptops and convertible tablet PCs, based on the Dell Latitude E-Family and customized by Dell OEM Solutions, are available with pre-configured customized software access to RIDGID informational resources and diagnostic tools. The laptops are designed

to work with RIDGID inspection systems and withstand harsh job site conditions, including pounding rain and blowing dust or dirt, extreme temperatures and accidental drops to four feet. **800/474-3443; www.ridgid.com/dell.**

Giant Introduces KamJet High-Pressure System

The trailer-mounted KamJet high-pressure water system from Giant Industries Inc. is designed to produce up to 7.1 gpm and 50,750 psi. The diesel-powered unit can be remotely operated and offers stepless pressure regulation. Features include a high-pressure plunger pump, stainless steel manifold, tungsten carbide plungers and synthetic seals. Fully self-contained, the unit has a 105-gallon water tank and 45-gallon fuel tank. **419/531-4600; www.giantpumps.com.**



RS Technik Introduces RS MaxPatch Point Repair

RS MaxPatch from RS Technik is a corrosion-resistant, fiberglass composite designed to repair and seal isolated pipe defects, cracks, leaks, joint offsets and root intrusion using CIPP technology. **919/481-1977; www.rstechnik.com.**



PureLine Introduces HP-1 Unit Generator

The HP-1 Unit electrochemical generator from PureLine Treatment Systems is designed to output up to 1 ppd of ultrahigh purity (99.5 percent) chlorine dioxide, produced within a totally self-contained unit. The HP-1 offers offsite remote communication,

allowing for on-off capability, process feedback control, programmable logic controller with color touchscreen operator interface terminal and an integrated distributed control system capability. **312/970-0276; www.pureline.com.**

Fluid Metering Offers C100A Variable-Speed Controller

The C100A variable-speed controller from Fluid Metering Inc. features both manual speed adjustment using a front panel mounted rotary dial, as well as electronic speed control via a 4-20 mA signal from an external source. Other features include IR compensation, current limiting circuit, and factory-set minimum and maximum speed adjustment. The controller also incorporates transient voltage protection and an AC fuse. **800/223-3388; www.fmipump.com.**



Sherwin-Williams Introduces Epoxy Tank Coating

Cor-Cote HT FF epoxy coatings from Sherwin-Williams Protective & Marine Coatings is designed for high temperature immersion and atmospheric applications, including tank linings and piping under

insulation at both ambient and high temperatures, as well as service with gasoline, fuel oil, ethanol and other hydrocarbons. The coating contains micaceous iron oxide for enhanced anti-corrosion and edge protective properties. The 90 percent solids coating is resistant up to 450 degrees F in a dry environment and will perform in areas subject to wet/dry cycling up to 300 degrees F. The self-priming coating provides high build and edge retention in a single coat. **800/524-5979; www.sherwin-williams.com.**

JWC Introduces Pre-Built Muffin Monster Manhole

The pre-built Muffin Monster Manhole sewer cleaning system from JWC Environmental is designed for cities, hospitals, condos, jails and other institutions facing rags, trash and debris-clogging sewer lines and pump stations. The system includes a pre-built fiberglass reinforced polyester manhole, Muffin Monster grinder, guide rails, access ladder, inlet and outlet piping connections and a manhole or hatch-type access lid. The low-speed, high-torque grinder turns troublesome solids into small particles that easily pass through sewer lines and pumps. **800/331-2277; www.muffinmonster.com.**



SJE-Rhombus Offers ECO SMART STATION Panel

The ECO SMART STATION control panel from SJE-Rhombus and its Best Controls Co., CSI Controls and Control Works Inc. divisions offers energy-efficient pump control in municipal lift station applications. The unit, housed in the Arc Armor enclosure, features a microprocessor-based controller with color touchscreen HMI, data storage and communication technology. The pre-engineered control panel is available in 29 models, from 10 hp to 100 hp. **800/746-6287;**

www.sjrhombus.com.

Perma-Liner Introduces Steam Cure

The Viper portable steam generator from Perma-Liner Industries Inc. allows for infinite working times, works with all diameter liners and provides for cure times of less than one hour. The generator is powered by a 0.75 hp Baldor electric motor with thermo overload. Features include a belt-drive TT941 triplex plunger water pump, stainless steel float tank, 10 gpm and 100 psi. **866/336-2568; www.perma-liner.com.**



Lowell Scott Introduces PTO-Powered TrunkPump

The 3-inch, high-volume, PTO-powered model TP-3PTV TrunkPump from Lowell Scott Enterprises Inc. is designed for one-person operation. The hydraulically powered dewatering pump is rated at 440 gpm and 26,400 gph at 40 psi and 90-foot head. **910/463-1282; www.trunkpump.com.**

Abresist Kalenborn Offers Epoxy Jointless Lining

KALPOXY epoxy-bonded jointless lining from Abresist Kalenborn Corp. is designed for structural components and repairs. The 70 percent solids compound completely cures at 68 degrees F in about 24 hours. It can be applied on nearly any surface, including overhead, in chutes, pipe systems, vessels, conveying systems and cyclones. The material can be mixed on site and applied by trowel to the desired thickness with no reinforcing required. **800/348-0717; www.abresist.com/KALPOXY.htm.**



Bentley Releases Pipe Renewal Planner Software

The Pipe Renewal Planner from Bentley Systems Inc. is a decision support tool designed to provide water utilities with a quantifiable and reproducible best practice for optimizing the replacement and rehabilitation of distribution network pipes. The software ranks the worst-

(continued)

performing pipes in the network, helping prioritize network upgrades. The planner is included in Bentley's WaterGEMS and available as an add-on module for the latest release of WaterCAD. 800/236-8539; www.bentley.com.



Greyline Introduces Area-Velocity Flowmeter

The AVFM 5.0 area-velocity flowmeter from Greyline Instruments Inc. uses a submerged ultrasonic sensor to continuously measure both velocity and level in the channel. The sensor is resistant to fouling and corrosion. It can be configured with a standard velocity/level sensor, or with submerged velocity and a separate,

non-contacting ultrasonic level sensor. Features include a backlit flow rate display, totalizer, three 4-20 mA outputs and two control relays. Intrinsically safe sensors and built-in data logger are available. 888/473-9546; www.greyline.com.

Highland Offers Oil/Water Separators

Oil/water separators for stormwater discharge from Highland Tank are designed to meet the Underwriters Laboratories Inc. UL-SU2215 design, construction and performance standards for engineered oil/water separators rated at 10 ppm oil and grease. The units feature a Corella coalescer that combines both a flat plate coalescer and a corrugated plate coalescer into a self-cleaning design. 814/893-5701; www.highlandtank.com. ♦



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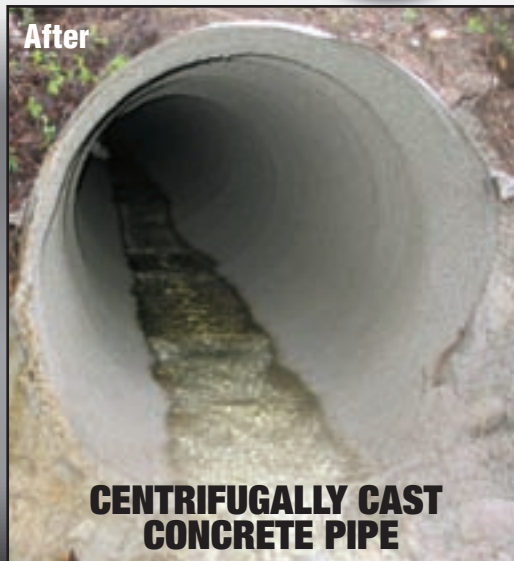
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INDUSTRY NEWS

MARCH 2011

Abresist Corp. Changes Name to Abresist Kalenborn Corp.

Abresist Corp. has changed its name to Abresist Kalenborn Corp. In business since 1977, Abresist Kalenborn Corp., Urbana, Ind., manufactures and installs a range of mineral- and ceramic-based abrasion-resistant protective linings. It is part of Kalenborn International GmbH & Co. KG, a parent company to 12 subsidiaries with facilities in Asia, Europe, North America and South America.

IPR Names Vellano VP Sales, Marketing

Mike Vellano has been named vice president of sales and marketing at IPR, provider of underground rehabilitation services. Vellano had served as general manager at RePipe, a division of IPR.

Wachs Partners with JD7 on Pipeline Services

Wachs Water Services has partnered with JD7 Pipeline Services Ltd. to provide proprietary leak detection and pipeline assessment technologies. JD7's Investigator provides HDTV images of the inside of pipelines, identifying tuberculation, features, liner condition and laterals while simultaneously detecting leaks in the line. WWS will also offer the LDS1000 leak detection system used on existing transmission lines. The product provides an HDTV image up to 3,000 feet from the point of entry into a pipeline without interrupting service.



Steve Keranko

RapidView Names Keranko Director of Sales

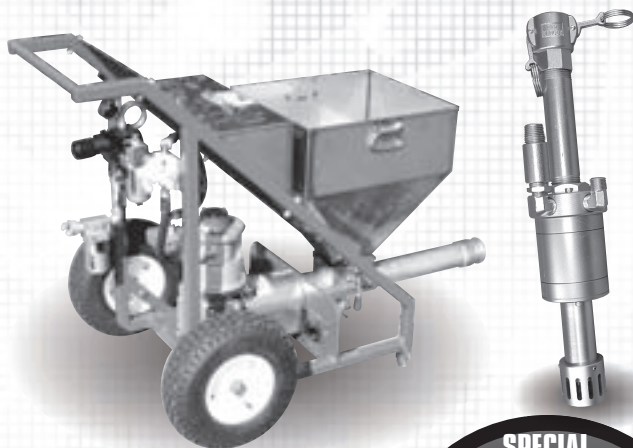
RapidView LLC has named Steve Keranko director of sales for both domestic markets and abroad. He has 15 years experience in technology sales and marketing. Keranko earned a Bachelor of Science degree from Indiana University with an emphasis in marketing and management.

Haaker, Son of Company Founder, Passes Away

John William "Bill" Haaker, 59, son of Haaker Equipment Co. founder John Haaker, passed away Dec. 17. Haaker joined the company in 1972, helping start and build the business. He also was a founding member of the Southern Section Collection Systems Committee (SSCSC). Haaker is survived by his wife, Cindy, son, Jake, and daughter, Robin. Memorial services were held Jan. 3.

Consortium Seeks U.S. Businesses for Global Projects Database

The Consortium for Global Development, through its Global Contractors Library database, seeks to match U.S. companies with projects in the \$130 billion global development market. The consortium is especially seeking small, medium and SBA 8(a) businesses. For more information on available projects and the free database listing, go to www.cfglobaldevelopment.com or www.global-contractors.com. ♦



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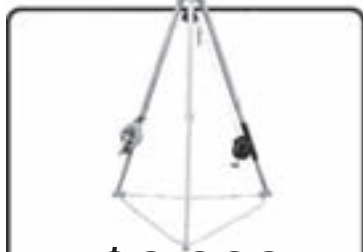
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(2) 1999 Sterling LT9501: Cat 3126 @ 230 HP, Allison A/T, spring susp., 86K miles and 82K miles, disc wheels\$19,500 Choice
715-546-2680 WI MBM



2002 Sterling V230H Vac-Con: Cat 210 hp engine, 26,000 GVW, 3.5-yd. debris body, 500 gal. water tanks, extendable boom, FMC water pump, 500' hose/reel/accessories, 122,000 miles.\$50,000 OBO
760-480-2347 CA M03



1998 Cues Mainline TV System: 1998 GMC Savanna 3500, Cues w/Pro-Data on-screen titler, Honda generator, Sony combo DVD/VHS, 1700' of multi-conductor cable, pan & tilt camera w/shorty transporter.\$39,500
608-835-7767 WI C03

THE COST OF FREE WATER

The nation's water and sewer utilities need to be able to charge what it takes to keep systems and service in sound condition

By Ted DeBoda, P.E.

While I stood in line at the grocery store, the gentleman in front of me put his bottled water on the conveyor and asked, "Remember when water was free?"

He was probably just looking for a simple nod, but I took the opportunity to explain that in reality, water has never been free. I noted that wars have been fought over the availability of clean water for thousands of years.

Based on his expression, I realized his question had been rhetorical, and I quickly changed the subject. But this short dialogue reveals that people really do think water is free, and that the public in general does not appreciate the value of the water and wastewater industry.

The people most acutely aware of this misperception are the municipal employees who make

sure our tap water is safe and our wastewater is sufficiently treated. As regulations become stricter and consent orders more prevalent, municipal resources are decreasing. Senior people and their experience are walking out the door. The economy has made these conditions worse, and the expression "more with less" is quickly heading toward "everything with nothing."

There is an old saying: What happens after a drought? It rains. Similarly, after this long period with no sewer and water rate increases, the inevitable must happen. Prices go up, and often sharply. We can see it all around the country.

It is important for sewer and water rates to reflect the true cost to provide services that comply with regulatory requirements while meeting an appropriate level of service to the customer. All too

often, we see politicians seeking re-election tout their ability to maintain water and sewer rates for several years, while the real effect is to tie the hands of the municipal employees who take pride in the service they provide.

There is an old saying: What happens after a drought? It rains. Similarly, after this long period with no sewer and water rate increases, the inevitable must happen. Prices

go up, and often sharply. We can see it all around the country.

In December of last year, the City of Delavan, Wis., which has not had a major rate increase for 17 years, considered a 14 percent



increase in water and sewer rates. The City of Sebring, Fla., which has had one increase since 1999, considered a 24 percent increase in water and sewer rates before settling on a flat increase of \$2.50 per month.

And Wausau, Wis., approved a 25 percent sewer rate increase for 2011, only the third increase since 1989. The increases would be much easier to manage if these cities and the myriad of cities across the country would make the small increases every year needed to sustain service and keep up with the economy.

It is also interesting to note that the increased monthly costs that go with the rate hikes mentioned above range from about \$2.50 to \$5 per month per household, totaling less than the cost of an average value meal at a fast-food restaurant. Compare this to increases in other utilities such as cable TV or natural gas, and this adds an interesting perspective, confirming that most people believe water and sewer should be free.

So the next time you hear a political ad saying we need more police officers and firefighters, consider also the other proud public servants — those who clean our blocked sewer pipes and repair our broken water mains at all hours. Let's give these public service employees the financial resources to maintain the level of service we expect — and the respect they so richly deserve. ♦

Ted DeBoda is executive director of NASSCO. He can be reached at director@nassco.org. NASSCO is located at 11521 Cronridge Drive, Suite J, Owings Mills, MD 21117.



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2001 Vac-Con water jet on an International model 4700, 50 gpm, 3000 psi, 1600 gallon plastic water tank. Was city owned. \$24,500. Pictures at www.khtrucks.com. 972-938-1905. (CPBM)

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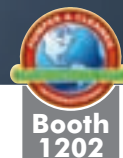
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