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April 2013

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BETTER MOUSETRAPS:
MICROMONITORING QUICKLY
PINPOINTS I&I SOURCES

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EVERY DROP COUNTS

Holly Springs gives
reclaimed water
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Kai Yannyo
Senior Operator
Holly Springs, N.C.

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INSIDE:

MANHOLES AND CATCH BASINS



ON THE COVER:

WRF senior operator Kai Vannoy inspects valves and meters at the Utley Creek Water Reclamation facility in the Town of Holly Springs, N.C. The water reclamation program is saving the town money and reducing the environmental impact of discharging water into Utley Creek. (Photography by John West)



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THANKS FOR JOINING US

The 2013 Pumper & Cleaner Expo was a celebration of the best technology and the brightest minds this industry has to offer



FROM THE EDITOR

Luke Laggis

The 2013 Pumper & Cleaner Environmental Expo was another great experience filled with new technology, new insights and lots of industry veterans with great stories to tell.

There were so many new products, many launched right at the Expo, from inflatable shoring to camera systems. Several companies had new hydroexcavators on display, and the technology they're putting to use is incredible. Smartphones are also being put to greater use, with new and emerging apps doing everything from providing monitoring functions to serving as a new viewing platform for CCTV work, so you can watch a live inspection even if you're not

there. It was truly the future of this industry and your utility on display.

The first-ever Demo Day drew people outside the Indiana Convention Center to take a look at some impressive products in action. Despite cold, wet and windy weather, five companies gave Expo attendees an up-close look at their products in action.

Hammelmann and Terydon teamed up to demonstrate a precision ultra-high pressure (UHP) abrasive cut using the Jack Track Cutting System. The system was powered by a high-efficiency Hammelmann pump with the dynamic plunger seal system, which eliminates the use of high-pressure packing. The cut was quick and easy.

Perma-Liner demonstrated its Top Gun continuous inversion system, which allows the cured-in-place liner tube to invert utilizing low air pressure. The steam-cured liner used in the demonstration inverts continuously without the need for above-ground water column towers, tall scaffold or excess water.

GapVax and NozzTeq also teamed up, with GapVax first demonstrating the MC Advanced Series combination sewer cleaning unit, and NozzTeq following with a demonstration of the BL SWIPER nozzle and the Paikert impact cutter for situations where digging isn't necessary. There was a good crowd on hand, and next year is sure to be better.

Beyond the technology, the greatest part of the Expo for me is meeting and talking to you. I speak with many of you from my desk in Northern Wisconsin, but the opportunity to meet face to face, to speak with you directly and hear your stories in person really brings everything together. It's great to hear how the work we're doing at MSW is making an impact on your work. That's the goal, and it's also the greatest reward.

There were many utility personnel on hand who have been involved in the post-Sandy cleanup efforts on the East Coast. The stories they told were incredible — and leant much more perspective to the devastation and work still ahead — than any national news story I've come across. You can look forward to seeing some of their stories on these pages as we move forward.

I also talked to a variety of municipal utility representatives from across the country. We talked about their work and I told them about stories I'm working on. Their feedback is invaluable, and that's really what this magazine and the Expo are all about: establishing meaningful relationships that help us toward our goals.

If you couldn't make it to Indy, start planning now so you can be there next year. It's the best thing you can do for your utility.

Enjoy this month's issue. ♦

I speak with many of you from my desk in Northern Wisconsin, but the opportunity to meet face to face, to speak with you directly and hear your stories in person really brings everything together.

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FOCUS: WATER

FORESIGHT IS 20/20

Burbank Water and Power has pursued a path of conservation, recycling and judicious pipe replacement to build an enviably efficient system

By Peter Kenter

California's Burbank Water and Power (BWP) boasts a successful water conservation program, an ambitious recycled water program, a system leakage rate of less than 3 percent, and a state-of-the-art, environmentally friendly head office dubbed the EcoCampus (see sidebar).

Team effort has transformed the utility, which, a little over a dozen years ago, was experiencing decreasing reliability in its water infrastructure.

"Stakeholders were beginning to question the value of their municipally owned utility and the utility was becoming concerned about the value it was bringing to the community," says Joe Flores, marketing associate and conservation manager with BWP. "In 1999, our current general manager, Ron Davis, joined BWP and started to develop a master plan for our infrastructure. He also kick-started restoration of the utility's value to customers through the three pillars of reliability, affordability and sustainability."

As part of its management framework, BWP began to develop explicit objectives specific to environment, finance, leadership, operations, organization and water management.

These goals, strategies and explicit performance measures are included in the city's annual budget.

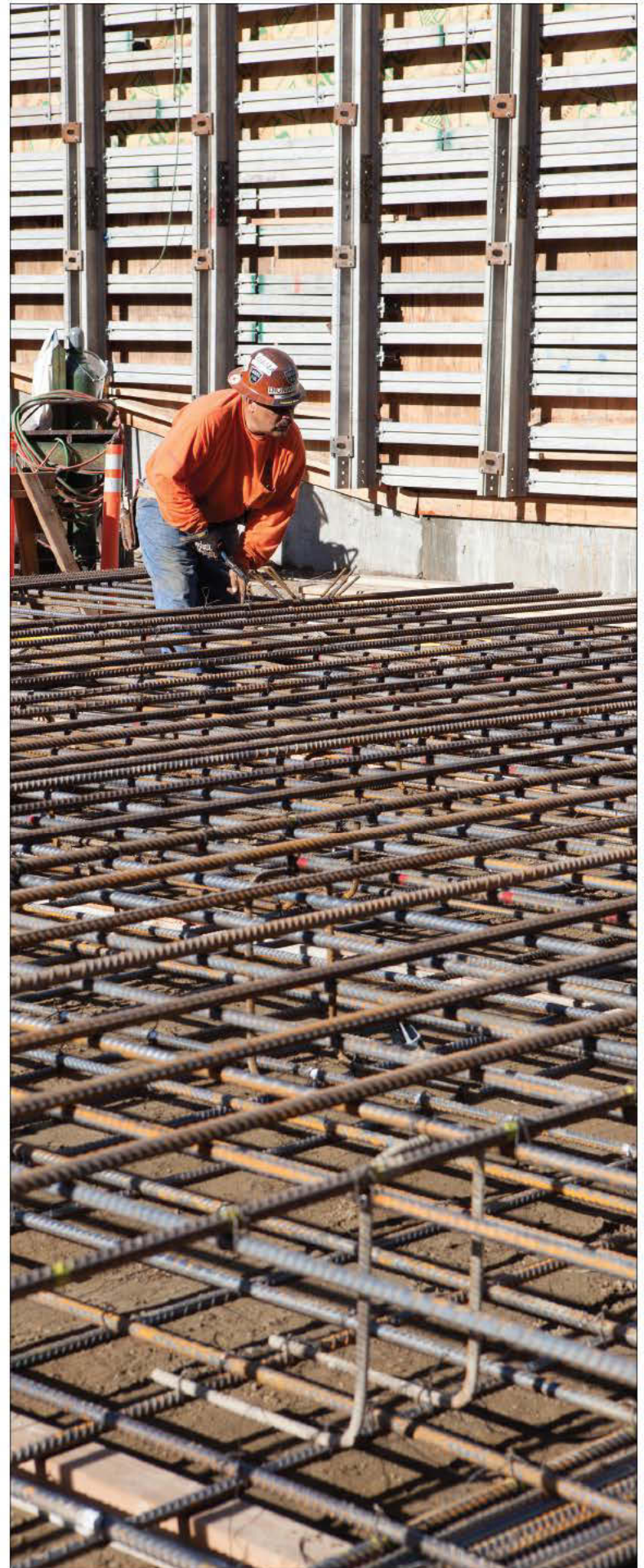
Making water do more

About 49 percent of Burbank's water is purchased directly from the Metropolitan Water District of Southern California, of which the city was one of 13 founding members. About 42 percent is groundwater drawn from the San Fernando Basin. The rest is recycled water produced by the Burbank Water Reclamation Plant.

"However, no matter how the numbers are divided up, it's all considered imported water," says Flores. "Even pumped groundwater and recycled water begin as imported water."

Burbank operates groundwater wells and a treatment plant, the Burbank Operable Unit, to pump and treat groundwater contaminated with volatile organic chemicals. However, even treated water must be blended with imported water before it's pumped into the potable water system.

Construction of Burbank Water and Power's new 9.5-million-gallon reservoir is under way. An outside contractor is handling the project. (Photography by Patrick Botz-Forbes)



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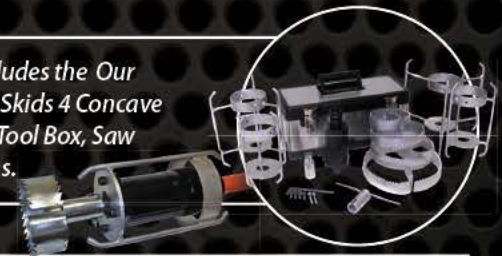


Thank you for coming to us at Southland Tool Mfg. Inc. at this years show in Indiana. It was better than ever. We look forward to having a great year with all the new people we have met and are looking in anticipation for next years show.

Thank you.

David Pryor, President

Puma Intelligent Hydraulic Root Cutter kit includes the Our Round Body low speed motor. Kit includes 4 EZ-Skids 4 Concave or Flat Root Saws in 6", 8", 10" and 12". Includes Tool Box, Saw hub, Turning Tool, Allen wrench and instructions.

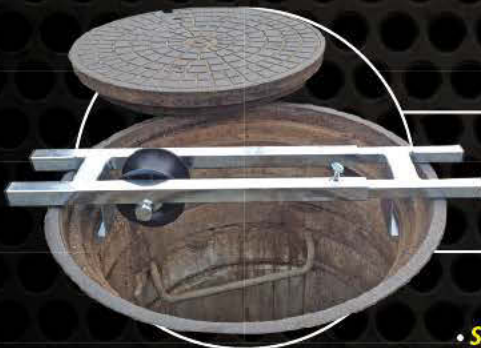


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BWP's goal, then, is to make its imported water do more — through aggressive leak control, conservation and recycling.

The potable water distribution system consists of about 280 miles of pipeline ranging from 2 to 30 inches in diameter. About 10 percent are transmission mains 12 inches in diameter or larger. The oldest pipes have been in the ground for 90 years.

Enviably low leakage rate

BWP's recently completed Water Distribution System Master Plan revealed that the system is in remarkably good shape. A study of leak data collected from 1953 to 2010 shows that the system experiences an average of seven leaks annually per 100 miles of pipeline, well below the national average of 24.

"What's noticeable is that, on average, the leak rate has been almost stable since 1953," says Basil Nahhas, principal civil engineer responsible for the potable water distribution system with BWP. One



PROFILE:

**Burbank Water and Power,
Burbank, Calif.**

YEAR ESTABLISHED:
1913

CUSTOMERS SERVED:
45,000 households and
6,000 businesses

AREA SERVED:
17.4 square miles

DEPARTMENT STAFF:
330

INFRASTRUCTURE:
280 miles of water mains

ANNUAL DEPARTMENT BUDGET:
\$40.6 million (2011-12)

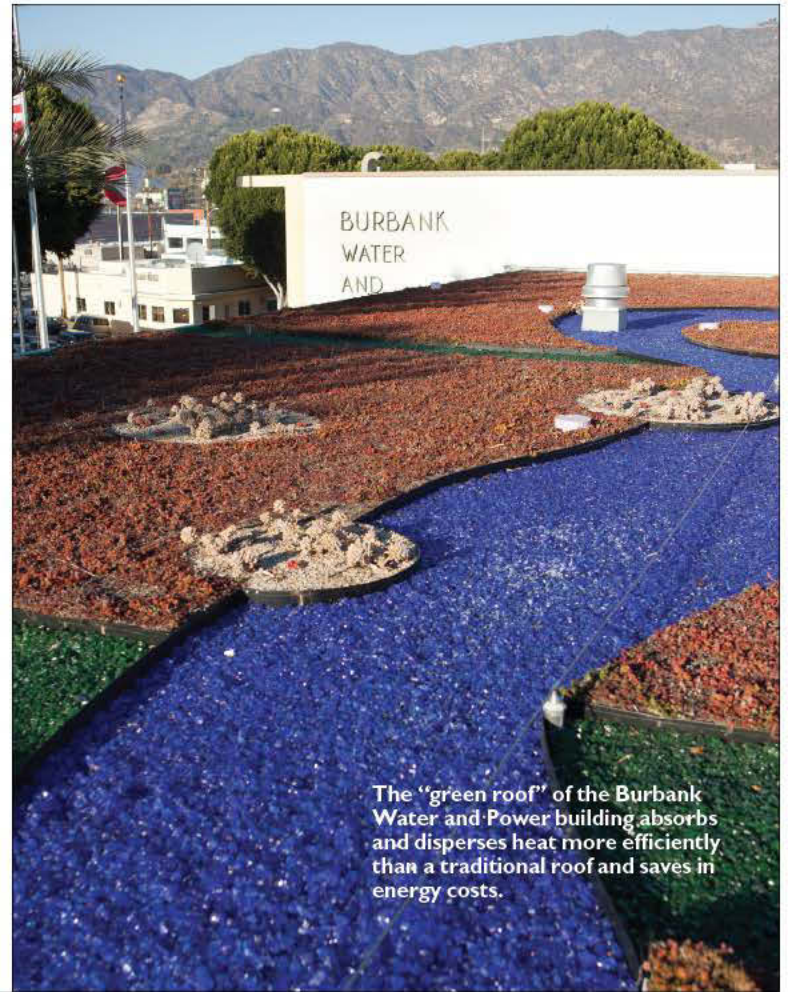
ASSOCIATIONS:
American Water Works Association, WaterReuse Association, California Urban Water Conservation Council, California Municipal Utilities Association, Water Research Foundation

WEBSITE:
www.burbankwaterandpower.com



This pocket of greenery along the street allows stormwater to collect and irrigate before flowing into storm drains.

of the reasons for the low rate is that the utility has consistently specified quality materials and designed its pipeline systems using heavier-walled pipes exceeding the commonly used safety factor of 2.0. The utility also required double cement lining inside ductile iron pipes. "These additional features help the distribution network to better resist the effect of corrosion. And for that, you can credit senior management and City Council when it comes to budget time," Nahhas says.



The "green roof" of the Burbank Water and Power building absorbs and disperses heat more efficiently than a traditional roof and saves in energy costs.

BURBANK WATER AND POWER'S ECOCAMPUS A MODEL OF SUSTAINABILITY

It's not often that a utility can demonstrate the sustainable landscape technologies it promotes to its customers at its own head office.

Burbank Water and Power (BWP), working with Los Angeles-based AHBE Landscape Architects, transformed its 23-acre main site into "The EcoCampus," a green space that integrates multiple sustainable technologies on one property.

"One feature is our Green Street that demonstrates five stormwater capture technologies over a full three city blocks," says Michael Thompson, principal civil engineer with BWP and project manager for the campus' Green Street feature. "One of its goals is to produce zero runoff of stormwater."

In addition to demonstrations of sustainable power, the campus features:

- The Green Street renovation project, which showcases five stormwater management systems: permeable pavers and a gravel reservoir designed to supply water to underground cells filled with planting soil to accommodate tree roots; the Silva Cell System, which creates an underground framework to support tree root growth; the Kristar Tree Pod System, which filters out pollutants found in stormwater runoff; infiltration planter bump-outs, featuring plants that thrive during both stormwater flows and summer droughts; and filtration planters, which use planter soil to remove pollutants from stormwater runoff before it infiltrates into the ground.
- Demolition of an unused substation, which has transformed BWP's Centennial Courtyard into sustainable landscaping. Courtyard stormwater is directed to an old utility tunnel that now uses plant species to filter runoff.
- Renovation of the historic BWP administration building, designed to achieve a LEED Platinum rating from the U.S. Green Building Council. Three rooftop gardens use plants to absorb more than 70 percent of rainwater that falls on the building. Two underground storage and percolation tanks capture overflow for infiltration.

"The EcoCampus isn't something that just happened in one flash," says Joe Flores, conservation manager with BWP. "It took over a decade to develop as we learned new ways of doing things. It's now something that our customers can learn from by seeing these technologies in action."

(continued)

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The utility fields a water main construction crew made up of eight workers who install waterlines up to 18 inches in diameter. Nahhas credits them for their conscientious work. "In-house construction crews tend to have a sense of ownership of their work," he says. "Our crews pride themselves on doing quality work."

Almost 80 percent of the pipes are cast iron and these demonstrate an even lower incidence of leaks, about three per year, as compared to a national average of 30.

"The pH and resistivity of our sandy soil are two good proxies to assess soil corrosiveness. The majority of the soil in Burbank is simply favorable to iron pipes," he says. "Additionally, the groundwater is chemically stable, at a consistent pH of about 7.8, which makes our water less aggressive."

The weak links in the system are 16 miles of smaller-diameter galvanized steel and cast iron pipes 4 inches or smaller. Most breaks occur in winter months, due to contraction of pipes when colder water enters them.

Prior to the new master plan, pipe replacement was conducted

on pipes that were substandard in size or material, pipes in streets scheduled for resurfacing, and upgrades and replacements necessary to support development. Under the new master plan, pipes are slated for replacement are based on their existing conditions and recent performance, and are placed into one of three categories. Category 1 indicates replacement in less than five years. Category 2 indicates replacement from five to 15 years. Category 3 indicates replacement from 15 to 25 years.

"To replace a pipe solely according to age doesn't make sense," says Nahhas. "We only replace pipes based on actual condition assessment, and after conducting an economic analysis to determine a cost-benefit ratio — there's no point in a proactive replacement if it doesn't add value to the commu-

From left, Matthew Elsner, principal engineer responsible for recycled water; Bassil Nahhas, principal engineer responsible for potable water; and Michael Thompson, principal civil engineer, stand in the middle of the Burbank Water and Power Campus.



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In order to use recycled water to generate power, the water must first be run through a reverse osmosis system. It is then subjected to another demineralization process, making the recycled water more filtered than distilled water (Puretec Industrial Water).

nity. Many utilities struggle with finding the sweet spot where replacement provides the maximum reliability at the lowest possible cost. This utility has found it.”

BWP has prioritized 32 miles of pipeline for replacement in the next 25 years at an estimated cost of almost \$35 million with an average replace-

ment rate of 1.3 miles per year. Utility officials expect this consistent and judicious renewal approach will enable the utility to continue to provide a reliable water service at the lowest possible life cycle cost.

BWP also conducts an annual valve maintenance and replacement program. Deficient valves are either

“To replace a pipe solely according to age doesn’t make sense. We only replace pipes based on actual condition assessment, and after conducting an economic analysis to determine a cost-benefit ratio — there’s no point in a proactive replacement if it doesn’t add value to the community.”

Bassil Nahhas

tagged for repair or replacement. Failing distribution system valves 12 inches and smaller are typically replaced — they’re usually irreparable — while large transmission system valves are repaired to extend the useful life of transmission mains. BWP plans to replace all transmission valves older than 70 years in the next five years at a rate of five valves per year. “Replacing only the deteriorated valves and avoiding the costly replacement of the whole pipe is a very cost-effective technique that should double the useful life of the transmission pipe,” Nahhas says.

New efficiencies

A conversion to smart meters from 2009 to 2011 saw some water meters upgraded, and the utility’s

existing Neptune water meters married to Itron transmitters. This helped to reduce unbilled water losses.

“Some older mechanical meters were not reading 100 percent of consumption,” says Flores. “Also, if we now see that a customer has consumption 24 hours a day, we ask ‘Is that normal for you?’ If it isn’t, there’s likely a leak somewhere.”

A reservoir replacement project is further increasing system efficiency.

“The original reservoir built in 1928 was basically a concrete-lined dam built against a vertical rock face and covered with a wooden roof,” says Michael Thompson, principal civil engineer with BWP, responsible for groundwater treatment. “It had been leaking and costly to maintain, so we’re replacing it with

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a modern reinforced concrete design with a concrete roof.”

The old reservoir offered a 6.9-million-gallon capacity. The new one will offer a 9.5-million-gallon capacity on the same footprint by excavating 5 feet deeper. Backup

reservoir capability will serve customers during the two-year construction schedule.

“Taking that leaking reservoir offline probably saved us as much as 1 percent in leakage,” says Flores. “That took us down those last few

points, so that we’re now down to 2 to 3 percent overall system leakage.”

Recycled water expansion

Recycled water also helps to reduce dependency on imported water.

BWP has been using recycled water since 1967, when it started using the water in its power plant cooling towers. The system gradually expanded to serve all the major irrigation customers within the city.

“The system has seen rapid expansion over the past three years with a \$17.5 million project to add 100,000 feet of pipe to recycled lines,” says Matthew Elsner, principal civil engineer responsible for recycled water. Today, Burbank’s recycled system includes over 27 miles of dedicated pipelines.

Burbank City Council policy requires larger water customers such as golf courses or major film studios to use recycled water. The city has also extended its recycled water system to serve customers in Los Angeles.

“By exporting recycled water to Los Angeles, we can exchange for groundwater credits that allow us to pump an equal amount of groundwater from the San Fernando Basin,” Elsner says. “Recycled water is a very attractive proposition for us. We expect to deliver more than 1 billion gallons of recycled water in 2013, with an eventual goal of supplying 15 percent of Burbank’s water supply.”

Burbank Water and Power’s new reservoir will actually be two smaller reservoirs very close together. The State of California has reservoir size restrictions, so two smaller reservoirs enable the utility to avoid certain requirements. Crews will also be able to perform maintenance on half the reservoir at a time.

“Recycled water is a very attractive proposition for us. We expect to deliver more than 1 billion gallons of recycled water in 2013, with an eventual goal of supplying 15 percent of Burbank’s water supply.”

Matthew Elsner

Under the state’s Water Conservation Act of 2009, all utilities will need to ensure that their customers use 20 percent less water per capita by the end of 2020 than in 2008. Burbank customers used an average of 195 gallons of water per day in 2008, and have already achieved the goal of the legislation by reducing usage to 149 gallons per day, better than its 155-gallon target.

While customers have largely maintained that level of performance, the numbers have briefly crept back above the limit on a few occasions.

“We’re well ahead of schedule, but the trick will be to stay below 155 gallons per day over the next few years,” says Flores. “But watching reports on those numbers has demonstrated to our customers that simple actions taken by each of them can dramatically reduce water use. Every step we take as a utility, and as customers, can help us to move closer to the goal of becoming a more sustainable water utility.” ♦

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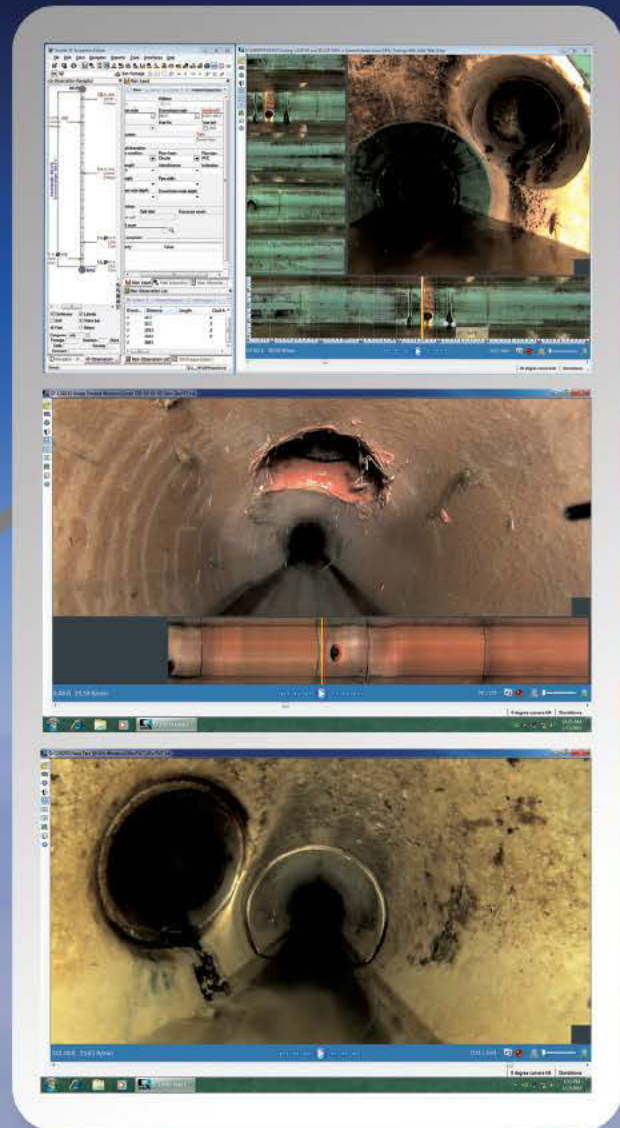
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Gwinnett County Water Resources trades associate III Mark Long starts MACP inspection in Lucy CMMS on his Panasonic Toughbook field laptop. (Photography by Jason Braverman)

FOCUS: SEWER

TYING IT ALL TOGETHER

A comprehensive asset management program enables Gwinnett County's wastewater utility to focus on preventive maintenance rather than emergency repair

By Jim Force

Today's water and wastewater utilities don't lack for data; modern technologies provide scads of it. The key to effective utility management is analyzing and assessing the information and using it to make critical operating and capital investment decisions.

Gwinnett County, Ga., has answered that challenge by creating a field-savvy Operations Technical Services group (OTS) charged with analyzing data, determining priorities and applying the utility's resources

in the most cost-effective way.

"Utilities have lots of information," says George Kaffezakis, division director for asset management and support. "The biggest challenge is having people who can analyze the data."

In the case of Gwinnett County, Kaffezakis says the utility's field crews — using GIS and computerized maintenance management — do a good job of gathering information. "But, the issue was 'what were we doing with the data?'" he says. "We had no one on the back end analyzing the information."

With support from senior management and the OTS group in place, Gwinnett County has been able to improve asset management across the board — from more complete identification of attributes, to prioritization of maintenance, to cost reductions on capital improvement projects and more.

Big system

Located in the northeastern part of the metropolitan Atlanta area, Gwinnett County is home to some 800,000 people and has been one of the fastest growing counties in

the United States over the last 20 years.

The county's Department of Water Resources represents the merger of separate county water and wastewater departments in the late 1980s. Three wastewater treatment plants serve the area — the F. Wayne Hill Water Resources Center at 60 million gallons per day, the Crooked Creek Water Reclamation Facility at 16 mgd, and the Yellow River WRF, recently expanded from 14.5 to 22.0 mgd. The wastewater collection system includes 2,600 miles of pipe, 225 pumping stations, 280 miles

(continued)

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of force mains and over 74,000 manholes.

Three in-house CCTV crews and Video Industrial Services (the County's SSES contractor) inspect about 180 miles of sewer line per year, using CUES equipment and POSM software. County crews use Vactor and Vac-Con trucks to clean lines as necessary, typically 200 to 400 miles per year. For larger pipes, field crews use a Mudmaster (CUES).

The utility conducts its own smoke-testing program and employs a full range of technology — open trench, CIPP, point repairs and pipe bursting — to repair and replace defective sewer pipes. In-house crews are supported in these efforts by contracted services. In 2012, Gwinnett County lined approximately 10,000 linear feet, pipe burst 1,800 feet, and replaced 8,500 feet. “We are looking at bringing additional rehab methods in, such as sliplining, mechanical seals and spiral-wound lining,” says Linear Asset Manager Deirdre Blackard.

Epoxy composite is usually the choice for manhole replacement in corrosive parts of the system. Blackard says the utility inspects manholes directly downstream from force main dump manholes and replaces structures that are sufficiently corroded. USPC supplies the replacement manholes and utility crews install them. If crews find only moderate deterioration, the manhole is lined by the utility's contractor.



Jeff Boss, division director of field operations, looks over a map in the field.



The Gwinnett County Department of Water Resources team includes, front, from left: George Kaffezakis, division director for asset management and support; Rebecca Shelton, OTS manager; Deirdre Blackard, linear asset manager; and Tyler Richards, deputy director, engineering and technical services. Back row: Jeff Callaway, construction manager I; Steve Sheets, OTS engineer; and Moubin al-Malla, Engineer I, with the utility's Vactor truck.

OTS development

After looking around for good asset management models at other large utilities, the Gwinnett County team formalized asset management as a disciplined process in 2007.

“It was part of our continuous self-improvement plan,” Kaffezakis says. “Everyone here was managing assets, but we decided to formalize the process and started a strategic asset management plan for each category of assets — what we were trying to accomplish with each asset, the level of service required, where the information was housed.”

More recently, the program has evolved into a tactical plan, enabling the utility to assess the criticality of various assets and prioritize where to spend the utility's resources.

“Our GIS system is very good,” Kaffezakis says. “It's foundational — containing all the basic information on what we own and where it's located, and it's available to our operations people in the field.”

But beyond linear maintenance management, Kaffezakis points out, the field staff wasn't really using the

information. The key to successful asset management at Gwinnett County has been the creation of the OTS group.

“We met with them and asked them what information they used,” explains Jeff Boss, the division's director of field operations. He says there was a gap between the information being collected and how it was being used. “No one had time to look at the data,” he says.

“The field staff knows what they're doing,” Boss explains. “They know how to keep water in the pipes, but asset management ensures that they will figure out the best way of maintaining those pipes.”

Enter the OTS

“In our asset management plan, the data comes back to our OTS, not our field people,” says Kaffezakis. “We take the data and use it to develop our capital improvement plans, flushing and root control protocols, how best to utilize our resources.”

The Gwinnett County team agrees that creating the OTS was their biggest challenge, and has



PROFILE: Gwinnett County, Ga., Department of Water Resources

FOUNDED:
Late 1980s by merger of
water and wastewater
departments

SERVICE AREA:
427 square miles
(all of Gwinnett County)

POPULATION SERVED:
800,000
(150,000 wastewater connections,
240,000 water connections)

INFRASTRUCTURE:
2,600 miles of wastewater
pipe, 280 miles of force
mains, 225 pump stations
and 3 wastewater treatment
plants

EMPLOYEES:
580 (water and wastewater
combined)

**ANNUAL OPERATING
BUDGET:**
\$6.1 million

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(continued)

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CLOCKWISE FROM RIGHT: Mark Long, left, and Water Resources associate III Tommy Williams prepare for an MACP inspection using the CUES QZ2 portable video inspection system; a close-up of the camera; the department uses Lucity for CMMS and Condition Assessment data hosting.



become their biggest success.

"It's not engineering, and it's not capital projects," explains Blackard. "It's several engineers, several technical people and several operational folks all working together."

The group was launched in January 2011 and consists of 12 people supported by FlowWorks, a Web-based platform for flow monitoring data management, and Lucity for CMMS and Condition Assessment data hosting.

Kaffezaakis says it's important that the OTS remain close to the operations group. "They're closer to the action and have greater ownership," he says. "It's important that the group stays small, developing tools and processes and optimizing operational practices and processes."

Blackard says OTS is able to work hand-in-hand with the field crews. "They feel invested in it," she says.

"We get better information, and it also holds the field personnel accountable."

OTS engineer Steve Sheets says overall, the team is able to provide better guidance to the field crews. He says the creation of a group dedicated to analyzing the data has improved the integrity and completeness of the information coming in from the field. "Our field crews now see that this (the data) does benefit them in the long term."

Good examples

In just over two years since its inception, the OTS concept is producing a handsome return. Better use of field staff time, elimination of redundancies and reduction in costs are measurable benefits, as illustrated by the utility's stream crossing and pipe flushing programs.

"We have over 3,700 stream crossings in our service area," says

OTS Manager Rebecca Shelton, referring to points where pipes cross streams. "It's impossible to inspect all of them every year. But using GIS and asset management, we've developed a criticality tool that identifies the consequences of failure and the likelihood of failure, and allows us to inspect the ones requiring more focus and attention — the 500 or so which represent the greatest risk."

The same can be said for pipe flushing. In the past, crews would flush pipes based upon routine rather than determining whether they needed to be flushed or not. Now, however, the condition of the pipe is recorded as it's flushed, and maintenance is scheduled based upon past performance to get crews on-site before a pipe fails or a customer's basement becomes flooded.

It's a proactive approach that costs less in the long run than if the utility were simply reacting to emergencies.

"It's allowed us to stop chasing our tails," says Boss. "We are able to stay ahead of the game, and we actually need fewer people and it's less expensive." Boss says that in 2010 and 2011, the crews inspecting manholes and easements numbered 10 people. Now it's down to four, reduced through retirements and attrition.

But even with fewer people, the utility's preventive maintenance has actually been bolstered through implementation of asset management planning.

"With fewer emergencies, the maintenance staff doesn't get pulled off preventive maintenance any more to respond to crises," Boss points out. "It's PM no matter what. We never have to stop PM to react to emergencies. We couldn't do that before."

Innovations in technology

The asset management approach has also allowed Gwinnett County to take full advantage of available technology and innovations. The crews are using Trimble hand-held GPS units, continuously updating the database as they inspect manholes and gravity mains.

"Last year, we had 7,000 unknown attributes (information on materials and age) on our pipes," says Sheets. "Now we're 99 percent 'known' on our attributes."

Infrastructure systems like these are always subject to corrections, Kaffezaakis maintains. "As our GIS people train the field crews, the crews bring new information back to the system and systematically improve it."

Web-enabled trucks are a big help in this effort. "By the end of 2012, every truck contained a laptop computer and a wireless connection, allowing crews to update information and process work orders live from the field," explains Boss. "We're as paperless as we can be at this point."

The system also improves routing efficiency, explains Shelton. "In the past, if we needed to service a house somewhere, we'd send the next available crew, no matter where they were.

"This is a large county," she says, noting that travel distances used to consume lots of fuel. Now they can locate a closer crew and assign them to the call.

"Our idling fuel costs have simply crashed," Boss says. "My fuel expenses are actually down this year. We haven't spent the budget."

Capital improvements

The increased flow and analysis of field data is also helping Gwinnett County get a better grip on capital planning and investment. "It's helping us in the field," says Kaffeza-

(continued)

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kis. “We’re analyzing the data, the work orders, and identifying items that need to be repaired or replaced. We’re able to prioritize projects that need to be done.”

“Everybody’s on the same page — engineering, construction,” he adds. “We meet with them monthly. We’re all in the loop and everyone knows what’s going on.”

The utility’s large number of pump stations provides a good example. “We have 225 pump stations; that’s a lot,” says Boss. “We were designing a pump station rehab project based on flow, but through smoke testing, we discovered that as much as half the flow we were designing for was coming from infiltration and inflow from private developments.”

Poor maintenance on the private side was the culprit, so the utility designed a program to help

“Utilities have lots of information. The biggest challenge is having people who can analyze the data.”

George Kaffezakis

private developers correct their I&I, and ended up designing smaller pump stations.

Asset management has proven to be an important tool in the utility’s effort to decommission some pump stations and reduce their number. Using life cycle costing, the Gwinnett County team has been able to determine when and where it is more cost-effective to obtain easements and run gravity lines into private developments than it is to maintain and operate a force main

and pump station.

“We look at the business case costs over a 20- to 40-year time period,” Boss says. “We’ve identified 15 to 20 pump stations slated for decommissioning.”

He says the exercise has actually boosted morale among the field crews because these represent force mains and pump stations that won’t have to be attended to in the future.

By analyzing operational data and using the life cycle approach, the utility has been able to justify capturing and reusing the digester gas to generate power at one of its treatment facilities. “With stimulus money available for the project, we performed a business case evaluation and found that with or without stimulus funding, the project was worth doing,” says Kaffezakis. A 2-megawatt generator has been added to the plant, and a second generator is being considered.

“The upfront capital cost was expensive,” says Kaffezakis, but he adds that the long-term cost-benefit ratio was favorable. “It’s a smart project, and it’s a green project.”

Final analysis

So, what’s next for Gwinnett County? Not necessarily anything new, according to Kaffezakis. “It’s an overused word, but the key is sustainability.

“We need to keep things moving,” he notes. “We don’t need a lot of new initiatives. We’ve already implemented a number of them. We need to make sure they have legs, rather than go off in a number of new directions. We need to focus on what we’ve got.”

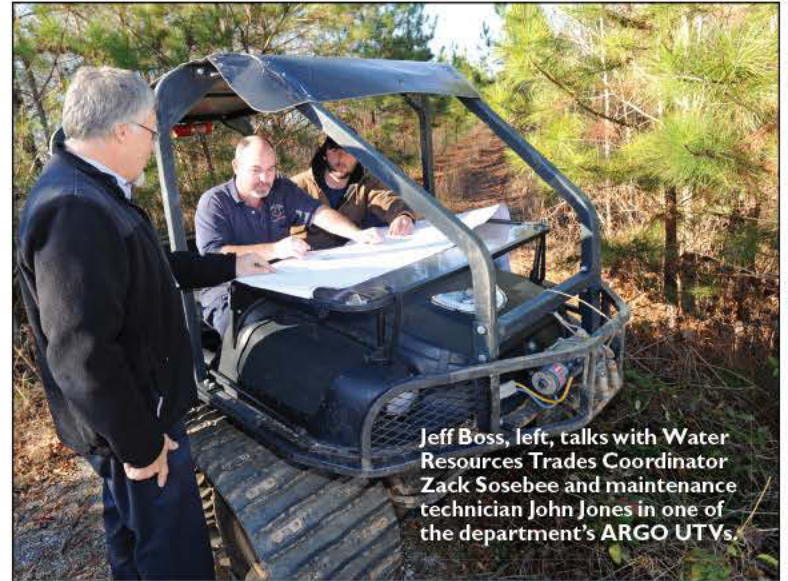
People are the critical element, in the eyes of the Gwinnett County team.

Boss puts it this way: “You need to make sure you have the right people. We’re anticipating the need for more help in our technical group to analyze the information and translate it to field operations.”

People are the key to sustaining the program, Boss believes, and Kaf-

fezakis agrees: “If there’s one take-away, it’s that asset management requires a serious commitment of people and resources.

“The rewards are certainly worth it, but we often underestimate the effort necessary.” ♦



Jeff Boss, left, talks with Water Resources Trades Coordinator Zack Sosebee and maintenance technician John Jones in one of the department’s ARGO UTVs.

THE WAR ON STORMWATER

For years, Gwinnett County fought off huge amounts of stormwater overflow at its treatment plant, yet when crews went out to inspect the collections system, they came back with the report that it was tight as a drum.

The problem, explains Jeff Boss, division director of field operations, was that they weren’t getting a very good look at critical lines and manholes in areas that were swampy or wet because they couldn’t get to them.

“Everything looked tight, yet we were getting spikes from the sewer system,” Boss says. “What we found was our crews were using our GIS system to find the manholes at the spots where the wall of water was highest, but were never inspecting them because the areas were too wet to get to.”

That doesn’t happen anymore because Gwinnett County has purchased a pair of ARGO UTVs (ultra-terrain vehicles that can navigate on land or water). They’re amphibious, and frequently used by hunters to navigate flooded areas and move both people and equipment successfully. Boss says once crews got used to the vehicles — he recalls one crew getting washed down river six miles because they hadn’t accounted for the current — they proved to be a great asset.

“We’ve been able to hone in on the manholes in the flooded areas and repair them. We’ve found broken cones, with trees growing out of some of them,” he says. “In some cases, we hadn’t gotten closer than 500 feet from these manholes for more than 17 years.”

In another effort to focus on problem areas, the Gwinnett Operations Technical Services team is using rain gauges. “The flooding is not all over the area,” Division Director George Kaffezakis says. “Using rain gauges helps us get to the basins that need inspection.”

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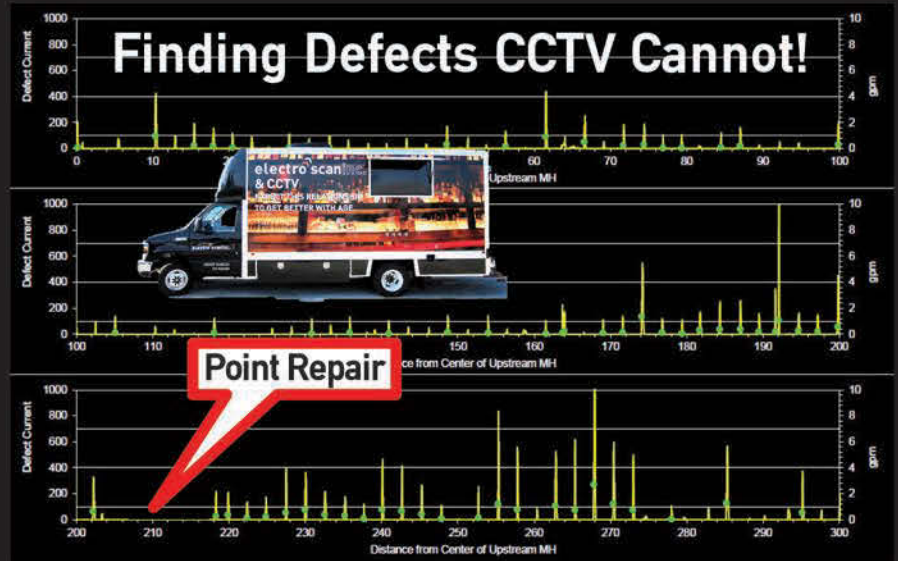
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Bad News: The Sewer Pipe had numerous other defects not seen by CCTV.

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2	Automatically Finds Leaks Inside Joints	N	Y
3	Automatically Finds Leaks at Service Connections	N	Y
4	Automatically Finds Sources of Infiltration at Cracks	N	Y
5	Automatically Finds Leak Locations (within 0.4 in or 1 cm)	N	Y
6	Automatically Measures Size of Leaks (Est. GPM or LPM)	N	Y
7	Automatically Finds Defects That Leak from Bad Couplings	N	Y
8	Automatically Finds Defects That May Still Leak After Repairs	N	Y
9	Automatically Finds Defects That Leak in Re-Lining Projects	N	Y
10	Automatically Finds Defects After Service Re-Connections	N	Y
11	Automatically Finds Leaks, If Silt or Debris on Bottom of Pipe	N	Y
12	Able to Conduct Inspections, If Sewer Pipe Is Full of Water	N	Y
13	Able to Determine Size of Potential Leak, If Roots Are Present	N	Y
14	Automatically Finds Leaks at Joints, If Grease Is Present	N	Y
15	Able to Determine Size of Leaks, If Pipe Has Encrustation	N	Y
16	Requires Active Infiltration to Identify Defect at Source	Y	N
17	Contains Moving Parts That Could Clog from Debris or Silt	Y	N
18	Requires Bypass During Inspection, If Pipe Full	Y	N
19	Requires Special Training and Certification to Identify Defects	Y	N
20	Relies on Visual Observations to Record Defects	Y	N
21	Ave. Speed of Inspection (6-20" Sewer Main)	3ft / min	50ft / min

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GROW YOUR MOST IMPORTANT ASSETS

The right management style can boost productivity, improve customer service, and keep employees engaged

By Ken Wysocky

It's easy for managers and organizations to assume their employees are happy and engaged. Here's a wake-up call, courtesy of a recent Gallup poll: Roughly 70 percent of American workers describe themselves as either disengaged or actively disengaged employees.

In other words, less than one-third of your workers likely are happy, engaged and productive — a number fraught with repercussions in terms of reduced productivity, costly employee turnover and poor customer service. “Everyone else is just there to eat the free food,” says Jay Forte, a noted business-performance consultant, speaker and workplace coach (www.fireupyouremployees.com).

If these employees — let's call them the 70 percenters — aren't enough to send human resource

remnant, if you will, from the industrial age, when jobs were more skill-based and centered on producing products, rather than talent- and intelligence-based and focused on providing good service.

“Back then, people were basically doing the same job each day,” Forte explains. “But today, we're not pushing levers on machines any more. Virtually every situation requires workers to think about it and choose a different response. Employees must pack their brain when they pack their lunch and make decisions at work.

“But while the work we do now is very different, the management approach has not changed,” he continues. “Too many managers still use a tell-them-what-to-do (or command-and-control) approach. But employees in an intellectual workplace need to be engaged and inspired. The old

“It's not the assets they own, but the brain power of their employees,” he says. “Organizations that realize this ... will transform human capital into financial capital and provide the best services at the most efficient cost possible.”

Right person, right job

So how does an organization rouse employees from their disengaged stupor? First and foremost, put the right people in the right positions. That means look less at their overall work experience and instead strive to determine what Forte calls their “hard-wired abilities ... their talents and strengths.” Then put employees in positions that play to those strengths.

That also means hiring employees based on their talents, not just their experience. That, in turn, will require a totally different mindset

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.

service rep, everyone who has done customer service work before and hated it will apply. You need to rewrite those job ads so they talk about behaviors, then source experienced people who exhibit those talents and behaviors the job requires. Put those together and employees will soar.”

Finding the right new hires may also require an unconventional approach to where your organization runs job advertisements, Forte says. For example, a company looking for what he calls a “bottom-liner” — someone who will push for big results — should place ads in an event program for marathons and triathlons.

“Think about where you can find people who possess the behaviors you need,” he points out. “Where do they live or shop, or what clubs do they join? Then everyone who applies is someone who makes sense for the job. You can't put a social person in an analytical job and vice-versa.”

Managing expectations

Next, companies and organizations must set clear performance expectations. As Forte likes to put it, they need to define what “done right” looks like for a particular job.

“Most people don't know, believe it or not. Managers think they just need to tell employees to do things, but they rarely give a clear definition of what ‘done right’ looks like,” he says. “After employees know what a successful outcome looks like, they

“Managers think they just need to tell employees to do things, but they rarely give a clear definition of what ‘done right’ looks like. After employees know what a successful outcome looks like, they can choose how best to approach the job.”

Jay Forte

directors into apoplectic mode, consider another Gallup statistic: About 65 percent of employees admit they do just enough work to avoid being fired, and another 17 percent coast along with a “Go ahead and do it, I'll find another job” mentality.

What's behind these depressing numbers? Forte firmly believes much of it stems from an outdated management philosophy — a vestigial

management ways prevent them from performing well.”

Organizations and managers must realize that in today's economy and workplace, the one thing that most impacts their bottom line is the collective genius of their employees, Forte says. Human capital, not fixed assets, is the most valuable resource. As examples, consider companies like Google and Zappos.

when, for example, companies develop job ads; it's imperative they clearly define what talents the job requires.

“Don't advertise that your group needs a customer service rep,” he explains. “Instead, say you need a person who can solve problems and see opportunities, and upholds a personal standard of excellence. If you just say you need a customer

can choose how best to approach the job.”

Lastly, managers must provide constant and recurring feedback — even for happy, engaged employees. “This creates a powerful rapport between management and employees,” Forte says. “Applaud them when they do things right and provide guidance in areas where they don’t perform well. That’s the ‘going from good to great’ formula.”

In the long run, Forte believes that resistance to a more engaging management style will diminish as more and more Baby Boomers retire, changing managerial mindsets from a command-and-control mentality to an engage-and-inspire mode, where managers are more of a coach than a supervisor.

“That’s not how most people do it now, and they’re not quite sure how to do it because they’ve never had to,” he notes. “There are so

many levels of behavior and culture that keep companies connected to doing things the way they’ve always done them.

“But I think our approach is getting legs because organizations can’t stand it any more,” he continues. “The pain of staying the same is worse than the pain of changing. It’s not hard; it’s just different. We try to create a practical, easy way to do it.” ♦

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The Stantec Micromonitor, installed here in a sewer line, is a modified version of a standard area-velocity flow probe with the addition of a fabricated fiberglass weir insert installed behind the probe on a single stainless ring. (Photos courtesy of Stantec Consulting Services)

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Kentucky Sanitation District 1

A NEW WAY TO TARGET I&I

Micromonitoring helps a Kentucky utility pinpoint I&I in less time and at lower cost, with less impact to private property owners

By John Barton and Rich McGillis

While impossible to eliminate all sensitive interactions with private property owners, micromonitoring can dramatically reduce the number of private property owners who are impacted by intrusive investigations and potentially costly repairs.

Kentucky's Sanitation District 1 (SD1) was facing a 2007 U.S. EPA consent decree to address combined and sanitary sewer overflows. The district needed a better means of identifying inflow and infiltration sources.

Among the many issues facing SD1 — which covers 220 square miles and 30 municipalities — was the prospect of investing millions of dollars in manhole, pipeline and lateral rehabilitation. One particularly vexing challenge was the cost, time and intrusiveness

associated with identifying infiltration and inflow into the system.

In the fall of 2011, SD1 agreed to participate in a unique micromonitoring program developed by Stantec Consulting Services Inc. The engineering firm was initially engaged to design a pilot test of one basin, employing its recently developed custom-made micromonitoring device and exploratory program.

The team targeted a single drainage basin where regional flow monitoring results had shown excessive I&I rates. SD1 had already lined every manhole and mainline,

but I&I remained too high and rehabilitation of approximately 129 laterals was scheduled. With budgeted costs of about \$4,500 per lateral, the next stage of work on this one basin was anticipated to cost about \$580,500.

The first round of micromonitoring tested eight reaches of the basin and revealed that 50 percent of the tested reaches had very low I&I and could be eliminated from further investigation. By excising these reaches from future rehabilitation, SD1 saved about \$240,000, investment in micromonitoring.

As the micromonitoring program in this pilot basin progressed, Stantec was able to zero in on just 12 homes where gutters or driveway drains were connected to the sewers, representing the predominate source of I&I for the entire basin. The results were in keeping with Stantec's findings on more than 200 sites where the micromonitoring program has been implemented for 10 other utilities. In some cases, more than 80 percent of the project area was eliminated from further testing.

SD1 has since commissioned micromonitoring on seven additional basins with more planned for the next four years.

Before the micromonitoring program

Before SD1 began implementing the micromonitoring program, its approach to identifying I&I was difficult, time-consuming and often intrusive for ratepayers. Moreover, the effort was not always very effective.

Consider this all-too-familiar scenario: A utility sets out to identify where the largest source of I&I is coming into a sanitary sewer system using traditional flow metering, smoke and dye, and CCTV methods in a neighborhood of 400 homes in a sub-watershed. They will often need to eliminate every storm drain for cross-connections, every house downspout, foundation drain, area drain, etc. At the end of the day, they may confirm that 25 percent of the homes have downspouts connected to one or two area drains. This means great effort and expense is expended to discover that 75 percent of homes had no inflow connections and were not contributing to the problem.

The micromonitoring program allows utilities to identify the largest sources of I&I over the course of just a few rain events and then concentrate more intrusive investigation efforts on those areas.

Solving the problem

Once the source of the I&I is identified, options for removing

these connections depend on whether they emanate from public or private sources. If the sources are due to SD1 assets, such as defective manholes, pipes, lateral connections, storm sewer or catch basin connections, the problems can be solved through rehabilitation, replacement or rerouting.

Micromonitoring helps to reduce the number of customers asked to make a change, limiting the amount of interaction while significantly refining the scope of the area where efforts should be concentrated.

Moreover, micromonitoring can distinguish whether the problem is an infiltration issue such as a defective pipe, manhole or lateral, or an inflow issue such as a downspout, area drain or storm sewer cross-connection. By distinguishing and identifying whether the source of



A Stantec micromonitor ready for installation in the upper reaches of a drainage basin in Kentucky Sanitation District I.

the water is inflow or infiltration, investigation efforts and rehabilitation methods can be more precisely planned and budgeted. While impossible to eliminate all sensitive interactions with private property owners, micromonitoring can dramatically reduce the number of private property owners who are impacted by intrusive investigations and potentially costly repairs.

As a result of this pilot micromonitoring program, SD1 has refocused and refined its overall strategy for I&I investigations. The utility now employs micromonitoring before the start of the majority of private source removal projects. This quickly and efficiently narrows down the area for SSES investigation work. In addition, the data

from micromonitoring has helped with SD1's asset management program and is being used to determine where rehabilitation and replacement will be successful for proactive asset renewal.

Understanding how it works

Conventional flow monitoring equipment can be unreliable in very low-flow situations where debris can obstruct the equipment. The micromonitor permits accurate measure-



Stantec senior associate John Barton, left, and engineering team leader Joseph Kamalesh begin installation.

ment of flows within small upstream collection system areas contributing to low base flows, locations where conventional flowmeters typically do not collect usable data.

Pipe segments that flow into the trunk line are targeted and monitored for only one or two storm events. The micromonitors are placed at strategic locations within a project area and a conventional flowmeter is placed at the downstream end to provide a regional confirmation. The micromonitors are then moved to locations in smaller sub-basins within the project area after a storm event that produces an I&I response at the downstream regional meter. The ability to make rapid decisions based on a single storm response

significantly reduces the cost of collecting data from each location and offers the opportunity to further hone in on segments with an identified I&I response.

The micromonitor device is a modified version of a standard area-velocity flow probe with the addition of a fabricated fiberglass weir insert installed behind the probe on a single stainless ring. The weir structure conditions the flow over the probe to prevent obstruction by debris, enabling the micromonitor to measure flows down to 1 gallon per minute, generally in low-flow sewer segments such as those with only a few houses.

Advantages

The cost-effectiveness is driven by the shorter monitoring duration needed at each location. Flow data from just one storm is enough to tell if a section of pipe has an I&I problem. It is designed for rapid deployment; no confined-space entry and no detailed site assessments are required. The micromonitors are versatile in nature; they function independent of pipe hydraulics such as offset joints, root balls and drop pipes, and can be applied to sewer segments with fewer than 50 houses where conventional flow monitoring will not yield usable data.

For water and sewer managers seeking ways to stretch budgets further, receive actionable data faster, and limit inconvenience to property owners during inflow and infiltration investigations, the micromonitor program employed by SD1 in Kentucky provides a useful and proven approach. ♦

A patent for the micromonitor is pending with the U.S. Patent and Trademark Office.

About the Authors

Rich McGillis is the senior manager of Collection Systems for Kentucky Sanitation District I.

John Barton, P.E., Ph.D., is a senior associate with Stantec in Cincinnati, Ohio, and an instructor for the company's flow monitoring program.

EVERY DROP COUNTS

Holly Springs' growing water reclamation program saves potable water costs and reduces discharge into a local creek

By Lisa Balcerak

Since 2010, the Town of Holly Springs, N.C. has been operating its wastewater treatment plant as a water reclamation facility, treating the sewage to less-than-potable standards for use in irrigation and industrial applications. The town distributed approximately 40 million gallons of reclaimed water in 2012, saving \$75,000 in potable water purchase costs and reducing the environmental impact of discharging water into nearby Utley Creek.

As a bedroom community 20 miles outside of Raleigh and near several universities, Holly Springs has seen steady population growth in the past two decades. In the late 1990s, the town council proactively planned improvements to the tertiary wastewater treatment system in



PROFILE:
Holly Springs (N.C.)
Public Utilities
Department

POPULATION:
25,000

AREA:
15 square miles

ANNUAL RAINFALL:
40 inches

ANNUAL BUDGET:
\$1.5 million – Utilities Dept.;
\$10 million utility fund;
\$25 million general fund

WEBSITE:
www.hollyspringsnc.us

Senior operators Terry Foster, left, and Kai Vannoy inspect an American Turbine I2-H-150 reclamation pump powered by a 125 hp US Motors three-phase motor (Nidec Motor Corp.) at the Utley Creek Water Reclamation Facility. The orange check valves are made by Milliken Valve Company. (Photography by John West)

(continued)

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A water-cooling tower houses reclamation piping about a half-mile from the water reclamation facility.

anticipation of higher demand. While planning the upgrades, the town wanted to reduce its discharge into the creek, and started considering a water reclamation program.

“There has been a move in North Carolina for more sustainable solutions to water usage, and reclaimed water has started spreading across the state,” says Jeff Peters, reclaimed water coordinator. “More municipalities are picking up on it. The town saw how well it was working in Florida where water is really limited and there was a good utilization of reclaimed water.”

Holly Springs’ original reclaimed water master plan was developed in 2000, but was shelved until the town could secure a large enough user to justify the system. In anticipation, the town began collecting a fee for all new development that would be added to the water reclamation fund. Eventually, Holly Springs Business Park and The Club at Twelve Oaks golf course and residential community came on board.

Building a system

In October 2009, Caldwell Tanks began construction on a 500,000-square-foot steel-over-concrete elevated storage tank located in an industrial park a half-mile from the reclamation facility. T.A. Loving installed 2.8 miles of reclaimed water distribution lines, and the system went live in July 2010. Holly Springs became the fourth, and smallest, town in North Carolina to start a water reclamation program, and the second town in the



The Town of Holly Spring WRF team includes, from left, Kai Vannoy, senior operator; Jennifer Exum, lab technician; Jeff Peters, reclaimed water coordinator; and Terry Foster, senior operator.

state to offer reclaimed water for residential use.

The \$2 million project was partially funded by a \$750,000 State and Tribal Assistance Grant from the North Carolina Department of Environmental and Natural Resources Division of Water Quality (DWQ). The remainder was funded through development fees.

The reclaim distribution system goes through the Holly Springs business park, which is near Novartis and The Club at Twelve Oaks, a 687-acre golf course and residential community. The development uses reclaimed water to irrigate 40 percent of its golf course and the residential landscaping.

In addition, the town uses reclaimed water for irrigation along the landscaped medians in the business park and for on-site operations at the reclamation facility. A new shopping center currently under development will be the next customer to use reclaimed water for irrigation.

During the hot months, the Novartis cooling tower peaks at up to 5 million gallons of reclaimed water usage per month, and Twelve Oaks uses 1.5 million gallons per month. In the winter, demand for reclaimed water is minimal. During the first full year of the system’s operation, the town distributed 19.5 million gallons of reclaimed

MAINTAINING A RECLAMATION SYSTEM

Maintenance of the reclaimed water distribution system is ongoing, but fairly simple for senior operator Kai Vannoy and the rest of the Public Utilities staff.

The team uses information from a SCADA system to perform constant distribution checks for large spikes in the meters, which may indicate a line break or leak. The staff conducts monthly water sampling throughout the distribution system to check for turbidity levels, nutrients and chlorine residuals. Valves are tested and exercised annually to ensure they are working properly, and the elevated storage tank is cleaned every two years by an outside contractor.

The Public Works group performs all repairs on the reclaim pipeline because it has the labor force and heavy equipment necessary and has procedures for cleaning and sanitizing equipment to avoid cross-contamination.

water, which more than doubled to over 40 million gallons the following year.

Users of reclaimed water save up to 66 percent on their water bill compared to the usual \$7.50/1,000 gallons for potable water. Reclaimed water for irrigation costs \$3.75/1,000 gallons, and industrial users pay \$2.50/1,000 gallons. The reclaimed water charges show up on the same bill as water, sewer and trash.

Holly Springs makes little profit from the sale of the reclaimed water because costs are slightly higher than just discharging water into the creek.

Reclaimed water is treated above typical wastewater standards. However, unlike the water discharged into Uteley Creek, reclaimed water requires an additional treatment step — disinfection with sodium hypochlorite — before going into the elevated storage tank. The town’s cost savings are generated from the reduction in drinking water it purchases from a nearby municipality.

The current distribution system is limited to a small area, but the goal is to expand it further. Town engineers are investigating the feasibility of using abandoned force

(continued)

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Kai Vannoy checks a 12-inch Badger Magnetoflow meter at the Holly Springs water reclamation facility.

“Environmental stewardship is one of the biggest benefits to the reclamation system. North Carolina is prone to drought conditions, so we are helping to foster more sustainable practices. We can reuse this water rather than putting it back into the creek.”

Kai Vannoy

mains throughout town to deliver reclaimed water to a larger area.

“There are other potential high-volume users developing in town that would also benefit reclaimed water, so they are looking at possible ways to get that water to them,” says Kai Vannoy, senior operator at the water reclamation facility. “The town is well-developed, so it’s not easy to install a new distribution line in neighborhoods. It would be burdensome for the residents and not very cost-effective for the municipality. The abandoned lines are already installed in the ground,

so that would be the most cost-effective way to do it.”

Avoiding cross contamination

There are challenges in maintaining two separate water distribution systems. To reduce confusion, Holly Springs has water responsibilities separated into two groups: Public Works handles drinking water distribution and sewage collections, while Public Utilities is responsible for treating wastewater and distributing reclaimed water.

Construction of the reclaimed

water pipeline was guided by several state codes and statutes. Reclaimed water standards set by the DWQ require all reclaimed water pipes to be marked with a Pantone 522 light purple color and labeled “Reclaimed water. Do not drink.”

“The biggest thing is making sure the systems are clearly marked,” Peters says. “When going out to shut off a valve, we want to make sure we’re shutting off the right line, whether it’s reclaimed or potable.”

The street valve lids for reclaimed water are square and painted purple to stand out against standard circular drinking water valve lids. Separation distances between the reclaimed water line and the sewer and potable lines must be 10 feet horizontally and 18 inches below the water line to avoid cross-contamination.

Above-ground hose connections for reclaimed water are not allowed. There can be no direct cross-connections if there are potable and reclaimed water in the same location. For instance, in a cooling tower, there must be an air gap separation between the piping to ensure no reclaimed water goes into the potable line.

To further prevent cross-contamination, all parties who install or maintain reclaimed water are required to go through training conducted by the Holly Springs Public Utilities group, as regulated by the DWQ permit.

Before beginning a new irrigation installation, the town’s engineering department checks out the contractor thoroughly to ensure proper qualifications and training. Holly Springs development inspectors and plumbing inspectors make sure piping and meters are connected properly throughout the building process.

Buying in bulk

Holly Springs began a bulk reclaimed water program in October 2012 for customers to get free reclaimed water if they pick it up themselves. The DWQ permit requires all reclaimed water users to be trained and licensed to ensure proper use, such as limiting runoff into streams and storm drains, and knowing where use is prohibited. Peters conducts the training himself.



EXPLAINING THE PURPLE PIPE

The purple-colored reclamation pipes and signs are visible around town, leading residents to ask questions. Jeff Peters, reclaimed water coordinator, takes the opportunity to educate the community whenever possible.

“We have a couple festivals in town so we are there representing the reclaimed water system to the public,” Peters says. “They can get information and ask questions about what the purple pipe in the ground means. They recognize it’s different but they may not understand its significance.”

The biggest education was for the Twelve Oaks community. Residents were very receptive to the idea of reclaimed water for irrigation.

“They were excited because they like green grass, and now they pay less for it,” Peters says. “But since the distribution system is currently in a limited area, it can be hard to promote it widespread to the entire community. People will ask me, ‘When will that come to my neighborhood? How can I get that in my area?’”

The bulk system, installed as part of the larger plant upgrade, includes a storage tank, pump station, meter and tracking system. Users swipe a keycard before fill-



A water tanker truck built on a Peterbilt chassis waits to be filled at the Town of Holly Springs Utley Creek Water Reclamation Facility under the supervision of Jeff Peters.

ing so the town can keep track of who is using the water. A gas pump-like system is set up for filling smaller tanks, and an overhead boom with a 4-inch pipe can be used for larger tanks. The bulk filling area is located on the reclamation facility site and is open during weekday business hours.

Potential uses for bulk water include hydroseeding, landscape irrigation, makeup water for brine slurry, sewer jetting, concrete makeup water and dust compaction on construction sites.

"We are gradually making people aware this bulk water is available," Peters says.

Reducing creek discharge

Although the water reclamation program is saving the town money by reducing the volume of water requiring treatment for potable purposes, another motivator has been reducing water discharge into Utley Creek.

"Environmental stewardship is one of the biggest benefits to the reclamation system," Vannoy says. "North Carolina is prone to drought conditions, so we are helping to foster more sustainable practices. We can reuse this water rather than putting it back into the creek."

Studies are currently underway to measure if the reclamation program has had a positive impact on nearby waterways, such as reducing nutrient loads.

Discharging less water into the creek also helps Holly Springs with

its National Pollutant Discharge Elimination System permit from the state, which dictates how much water can be discharged from the treatment plant. The town stays well within its discharge limits by diverting some water to reclamation.

"Each gallon of reclaimed water used saves a gallon of potable water that can be used for cooking, drinking and human consumption," Vannoy says. "Thus, the community spends less on the cost of potable water and extends the availability of water for future generations in an environmentally acceptable and friendly way." ♦

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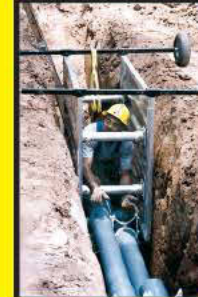
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BUILDING A BETTER TEAM

Meeting our objectives requires the cooperation and combined efforts of other industry organizations

By Ted DeBoda, P.E.

Many initiatives have been born from our efforts to set industry standards for the assessment and rehabilitation of underground infrastructure and to assure the continued acceptance and growth of trenchless technologies, more than we can possibly tackle on our own. For that reason, it is imperative for us to work closely with organizations with overlapping goals and objectives to best support our industry.

We have been building our relationship with the Water Environment Federation since we incorporated the Pipeline Assessment Certification Program into WEF's Operations Challenge two years ago. Each year the PACP portion of the collection event will grow more challenging, and we would ultimately like to include video coding.

During the 2012 WEFTEC in

New Orleans, I had the opportunity to meet with several members of the WEF Collection Systems Committee, including Keith McCormick, the current committee chair; Christine Radke, the staff manager for the Collection Systems Committee; and several others to discuss increasing collaboration between NASSCO and WEF. Since then, there has been an open line of communication between NASSCO and WEF as we build the groundwork for projects that make good sense to pursue together. Some of these initiatives include:

- Incorporating NASSCO training into events such as WEFTEC and the WEF Collection Systems 2013: Gold Nuggets of Knowledge. We look forward to offering NASSCO training for PACP at the collections conference in Sacramento, Calif., in June 2013.
- Producing joint WEF/NASSCO

webinars biannually to provide the latest information about rehabilitation technologies.

- Continuing to present to local WEF member associations to provide basic information concerning PACP and ITCP (Inspector Training Certification Program) and rehabilitation technologies, as NASSCO's lateral committee did in November 2012 during the Chesapeake Water Environment Association's program, "It All Starts with Laterals."
- Participating in the WEF Fly-In on April 17-18 to encourage our lawmakers in Congress to invest in infrastructure by supporting programs such as WIFIA and state revolving loan programs.

During virtually all of my PACP classes, I encourage students to get

involved in NASSCO, their local WEF member association, or other associations that facilitate networking with professionals with similar goals and objectives. As underground technologies advance, it is important that national organizations such as NASSCO, WEF, NASTT, UCT and others work together to facilitate the success of these technologies and assure their continued acceptance and growth. And nothing facilitates these advancements like increasing the success rates of these projects.

NASSCO wants the industry to know that we are open to partnership with any and all organizations that share our common goal — to set standards and build awareness for trenchless technologies. ♦

Ted DeBoda is executive director of NASSCO. He can be reached at director@nassco.org.

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MANHOLES AND CATCH BASINS

By Craig Mandli

Catch basin riser

Catch basin risers from **American Highway Products** are used to reduce cost and streamline the adjusting of utilities to the new grade when paving a road. Riser heights start at 3/4 inch and increase in 1/4-inch increments, with inclined risers available. They keep municipalities from having to excavate to manually adjust frames, leading to lower liability and brick-and-mortar costs. Custom designs are available to meet job specifications. **888/272-2397; www.ahpl.com.**



Manhole rehabilitation system

The **PermaCast Self-Install** system from **AP/M PERMAFORM** rehabilitates manholes using a bidirectional robotic spincaster to apply thin layers of high-strength, fiber-reinforced cementitious grouts to the interior of failing manholes. The spincaster is lowered from above, usually eliminating the need for confined-space entry. A bidirectional spray nozzle spins in one direction on the descent and the opposite direction on the way up to prevent concrete shadows, resulting in a smooth, watertight structure that tightly adheres to and stabilizes the existing manhole. It can be used to repair brick, concrete or steel manholes. **800/662-6465; www.permaform.net.**



Epoxy system

Infrastructure Repair Systems' manhole rehab system is a two-part, 100 percent solids thermosetting epoxy system that features two trowel-on applications to seal and stop leaks. "Chim Coat" for the chimney portion of the manhole is a flexible epoxy coating that will expand and contract with changing temperatures near the surface. "Infragard Topcoat" can be applied as a patch to a portion or to the entire manhole as needed. This system can also be used as a coating or sealant for catch basins, outfalls, and a multitude of surfaces including concrete, brick and metal. **877/327-4216; www.irsi.net.**



Mortar application machine

The **PortaMortar** application machine from **Madewell Products Corp.** mixes, pumps and sprays high-build restoration mortar and 100 percent solids epoxy coatings in difficult-to-reach areas using the hydraulic power available on most skid-steer loaders. **770/856-4470; www.madewell.net.**



Concrete waterproofing additive

Crystal-X concrete waterproofing additive from **ConShield Technologies** protects new and existing concrete sewer pipes and manholes, as well as dams, reservoirs, bridge decks, foundations, sewage and water treatment plants. **877/543-2094; www.conshield.com.**



Manhole ring adjustment system

The **PRO-RING** from **Cretex Specialty Products** is a lightweight concrete alternative made of expanded polypropylene. It can be easily assembled by hand and is immediately ready for traffic loading, eliminating the need for handling and transportation equipment. The ring's expanded polypropylene will not degrade with exposure to hydrogen sulfide, road salts or other corrosive elements. It's also designed to absorb the energy of traffic impacts, withstanding the load, but reducing the dynamic shock wave before it transmits down into the structure. It's much lighter than concrete, with 6-inch adjusting rings weighing as little as 14 pounds. It is designed to offer 1/4-inch adjustments and slopes to match virtually any grade without the use of shims and mortar. **800/345-3764; www.cretexseals.com.**



Grout rehabilitation system

The line of portable truck- and trailer-mounted **grout rehabilitation systems** from **CUES** is geared toward mainline, manhole and lateral joint sealing. Systems feature current CCTV equipment and decision support software for television inspection, allowing condition assessment and subsequent rehabilitation to be combined. Sealing packers are available for mainline and lateral assets. Units can be configured to run urethane-, acrylimide- and acrylate-based grouts. Systems can be mounted in a dry freight box for export. The Graphical User Interface guides users through the grouting process. **800/327-7791; www.cuesinc.com.**



Catch basin inlet units

The **5000 Series** hinged catch basin inlet unit from **EJ USA** has a heavy-duty assembly that incorporates a bolted EON LOCK design to limit unauthorized access and theft. The units are ergonomically preferable versus complete grate removal, and are also a time-saver, as effective locking can be achieved with only one bolt instead of four. **800/626-4653; www.ejco.com.**



Sewer alarm and reporting system

The **M80** system from **Mission Communications** is an in-sewer alarm and reporting system that tracks and monitors manhole surcharges and overflows. The cellular-based system is battery-powered and installs in about an hour. Alarm notification setup is performed using a customer Web portal, and alarms are delivered by any combination of phone call, text message, email, fax and/or pager. Specialty reports, like the CSO/SSO report, compile data trending for management and compliance purposes. The system's electronics, radio and battery are housed in a waterproof polycarbonate container. **877/993-1911; www.123mc.com.**



Watertight manhole cover system

The **Lifespan System** from **Hamilton Kent** is a watertight, corrosion-proof, locking, rubber manhole frame and cast-iron cover system that prevents rain-derived inflow from entering sanitary sewer systems and underground structures through the top of the manhole. The system has been tested to withstand 5 psi of water pressure and will still perform when the cover is under standing water. It is AASHTO H-25 load tested and suited for heavy traffic areas. The system's tapered risers allow for simple adjustment of the frame to match virtually any surface grade. The locking mechanism deters unauthorized access and manhole cover theft, and eliminates rattling covers. It is available in 24-, 27- and 30-inch clear opening sizes. **800/268-8479; www.hamiltonkent.com.**



Riser ring

Manhole riser rings from **LADTECH** can be installed in minutes. The rings nest together, and include a 2 percent slope ring and a 1/4-inch spacer ring for a precision fit. They're made of high-density, lightweight recycled polyethylene, meet AASHTO's HS-25 axle-loading spec, and are impervious to the H₂S corrosion that destroys concrete. **877/235-7464; www.ladtech.com.**



Cured-in-place manhole liner

LMK's CIPMH for chimney or full-depth manhole lining eliminates infiltration and inflow through manhole walls. It is engineered to resist freeze-thaw cycles and creates a watertight, corrosion-resistant structural lining. It requires no digging and is made to fit all manholes, including barrel sections, eccentric and concentric cones constructed of brick and mortar, pre-cast or block. Site preparation and installation can occur in the same day, eliminating the lead-time for ordering. Once the liner has been vacuum-impregnated and manually inverted into the manhole, it cures under ambient temperatures in one to two hours, depending on the depth of the manhole. **815/433-1275; www.lmktechnologies.com.**



Coating and lining system

SherFlex elastomeric polyurethane from **Sherwin-Williams** is a 100 percent solids, single-coat aromatic coating and lining system designed for manhole liners. It offers high-impact abrasion resistance. The flexible film bonds to the substrate with a moisture-tolerant epoxy primer, has crack bridging capabilities, and can withstand minor soil movement and pipe shifting. It is formulated to allow an applicator to directly fill surface voids, shortening roadway disruption. It is spray-applied at dry-film thicknesses of 80 to 120 mils. **800/524-5979; www.sherwin-williams.com/protective.**



Tube holder

The **Deep-Vac** manhole tube holder from **Southland Tool Mfg.** is designed to eliminate the threat of vacuum tubes extending up in the air. Simply clamp the device around a tube in any location, then lower it into the manhole while supported by the device's four steel extension arms. Tubes are added by un-clamping the device and moving it up and over the next flange connection. The suction boom hose can be connected to the end tube to support the weight as tubes become heavier. The device weighs 10 lbs., and is designed for manholes from 24 to 36 inches, with extensions available for larger openings. **714/632-8198; www.southlandtool.com.**



Manhole liner system

The **Multiplexx PVCP** cured-in-place manhole liner from **Terre Hill Composites** eliminates sewer gas-induced corrosion and groundwater infiltration. The PVC barrier arrests corrosive sewer gasses and protects all other components in the lining system, resulting in zero loss of designed liner strength. A 10-year warranty backs the system. It yields a Quantifiable ROI whether eliminating infiltration or stopping acid corrosion of wastewater structure substrates for the duration of a 50- to 100-year expected life. **800/242-1509; www.thcomposites.com.**



Epoxy coating

Perma-Poxy Plus from **Perma-Liner Industries** is a 100 percent solids, two-component ultra high-build epoxy coating designed to be applied over brick, concrete or metal structures, or as a topcoat over Perma-Mortar or Perma-Mortar CA. It provides abrasion resistance for concrete and steel sewage structures such as manholes, wet wells, digesters and clarifiers, along with mixer blades, shafts and other steel machinery components in contact with aggressive liquids. The product is applied using specialized plural component spray equipment. It contains no flammable solvents, can be applied to horizontal or vertical surfaces, is effective on interior and exterior surfaces, and up to 125 mils can be applied in a single coat. **866/336-2568; www.perma-liner.com.**



(continued)

Photo ionization detector

The **OLCT 200** photo ionization detector from **Oldham** measures sub-ppm concentrations of hydrocarbons or VOCs, which are included in many sealants, epoxies, coatings and chemicals. It isn't susceptible to poisons or damage by high gas concentrations, and can be used in inert atmospheres. The detector features wireless connectivity, making it ideal for confined spaces such as manholes and catch basins. 800/338-3287; www.oldhamgas.com.



Cleaning nozzle

The **Alphajet** cleaning nozzle from **USB – Sewer Equipment Corporation** is designed to clean grease, sludge and crusts from lift stations and manholes prior to rehabilitation. The nozzle is actuated by pressurized water from the jetter truck. Four driving nozzles create a 360-degree controlled rotation in a horizontal plane, eliminating the need to cover the manhole. The body requires no lubrication or replacement of internal mechanical parts within the first 12 months. Nozzles can be extended to accommodate various sizes of manholes/lift stations. 866/408-2814; www.usbsec.com.



Liner pinch roller

The **pinch roller** from **Quik Lining Systems** allows for the installation of unlimited lengths of resin-impregnated liner from 3- through 8-inch diameters, and can handle all products designed for an inversion-type installation. It allows precise calibration of up to 10-inch-diameter CIPP tube and virtually any design thickness from 2 to 100 mm. The roller is for the rehabilitation of a cleaned line in less than four hours with a single operator. A four-man crew can install up to six liners per day. 714/296-5262; www.quiklining.com.



Inside sewer drops

Drop Bowl sewer drops from **RELINER/ Duran Inc.** eliminate troublesome outside drops in manholes and clean up failed inside drops. They can also be utilized as stormwater drops. When used in wet wells to eliminate uncontrolled drops, they help prevent pump cavitation and the intake of aerated influent, which increases pump life. They are cost-effective and made of marine-grade fiberglass. The bowls easily attach to manhole walls with stainless expansion bolts. Their compact, low profile provides full access to areas below. They are available for outlets ranging from 4 to 48 inches for box and round structures in most diameters. Laser-cut, stainless pipe supports for the drop pipe are also available. 800/508-6001; www.reliner.com.



Manhole cover remover

The **Lifter** from **Rock Mills Enterprises** is designed to safely and efficiently remove manhole covers and drainage grates with the push of a button by the vehicle operator. It mounts into a standard 2-inch trailer hitch receiver and is powered by the vehicle battery. With a roadway camera and dash-mounted monitor, the operator is able to position it directly over the cover and remove it with the remote control. With an optional swing arm, the cover can be swung away from the opening and replaced after work is completed without moving the vehicle. 712/451-6550; www.rockmillsent.com.



Utility sealant

Flex-Seal utility sealant from **Sealing Systems** is a plural component aromatic urethane that features 800 percent elongation and a tensile strength of 3,200 psi. It's designed to prevent inflow/infiltration and to provide corrosion protection at the grade adjustment ring or joint section of manholes and catch basins. The sealant is manually applied using a paint brush, and is designed to cover 12 vertical inches on a 27-inch-diameter manhole. It will pass a vacuum test according to ASTM standards, provides protection from hydrogen sulfide and salt deterioration, and is easy to apply without special equipment. 800/478-2054; www.ssisealingsystems.com.



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Structural epoxy system

CPP from Epoxytec is a solid epoxy designed for trowel or spray application. It is formulated to provide a structural liner, coating or patch for rehabilitation of physical infrastructure and protection against corrosion. It is moisture-insensitive and forgiving, making it ideal for underground infrastructure. When applied by a certified applicator, the product can carry a warranty of up to 10 years. 877/463-7699; www.epoxytec.com.



Inflatable plug

The large Flow-Thru Type "D" inflatable plug from Logiball is ideal for bypass pumping. The double-action bladder inflates simultaneously against the host and bypass pipe or pump suction hose, saving time and minimizing discomfort. The plug is available in diameters of 3 to 36 inches. 800/246-5988; www.logiball.com.



Manhole insert

The RAINSTOPPER manhole insert from WBE Dorcas prevents additional inflow from entering the sanitary sewer system, eliminating contamination from unwanted rainwater, dirt and debris. The inserts are easy to install, are available in HDPE or stainless steel, are sewer gas-vented with a non-mechanical device, and prevent unauthorized entry with an OSHA-approved lock. 719/686-5988; www.wbedorcas.com.



Rehabilitation material

Strong-Seal MS-2 C manhole rehabilitation material from The Strong Company is a calcium aluminate mix with alkaline-resistant fiberglass reinforcement specifically formulated for moderately corrosive applications with a pH of 2.0 or higher. It is used to form a structural monolithic liner covering all interior substrate surfaces, stopping inflow, infiltration and exfiltration while restoring structural integrity. It meets or exceeds ASTM testing standards. 800/982-8009; www.strongseal.com.



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Grout prevents contamination

Problem

A broken sewer line in Baltimore, Md., allowed wastewater to infiltrate voids in the mortar joints of a brick stormwater vault. Officials looked for ways to seal the leaks.

Solution

Contractors applied a **hydrophilic polyurethane grout from Fox Industries/Simpson Strong-Tie**. They used an airless spray pump attached to injection ports to reach the void behind the vault. As the material contacted water, it foamed, expanding up to seven times its original mass and creating a flexible, waterproof membrane. Workers patched the port holes with hydraulic cement.



RESULT

Once the material cured, workers could apply various skim coats to unify the vault's appearance and provide additional chemical protection. 888/760-0369; www.foxind.com.

Materials prevent corrosion, restore structures

Problem

Six force main discharge manholes in Amity Township, Pa., were severely corroded. The Board of Supervisors asked Corrosion Technology Systems to recommend a long-term solution.

Solution

SWERP of Lafayette Hill won the bid to clean, repair and seal the manholes. Workers hydrojetted the concrete structures to obtain a bonding surface, then used rotary spray equipment to apply a 1/2-inch-thick cementitious layer of **RestoKrete substrate resurfacer F-121 from Sauereisen** and a 125-mil-thick epoxy coating of **SewerGard 210RS, also from Sauereisen**.



RESULT

The cementitious lining rebuilt structural integrity and prevented inflow and infiltration. The epoxy coating protected the resurfaced manholes from future corrosion. 412/963-0303; www.sauereisen.com.

Tank cleaning technology

Problem

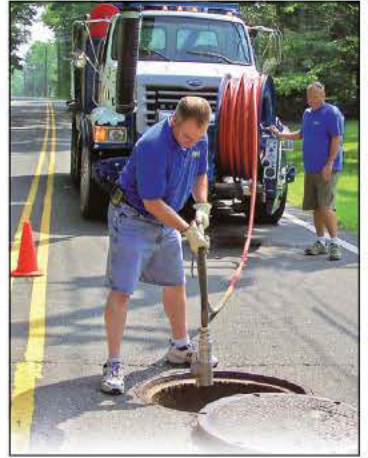
Agent Ryland Holmes of Virginia Public Works Equipment Co. in Ashland, Va., had municipal customers in the Tidewater area who were struggling

with grease accumulating in their lift stations. They needed an effective solution that did not demand more manpower or increase the budget.

Solution

After speaking with a representative from **Gamajet Cleaning Systems**, Holmes scheduled a demonstration of an **EZ-8 rotary impingement tank-cleaning machine** configured to operate with an 80 gpm/3,000 psi combination sewer cleaner from the City of Virginia Beach Department of Utilities.

Impingement cleaning uses a concentrated jet stream expelled in a controlled circular pattern. As flow and pressure increase, the radiating force of the liquid scours the vessel and provides a cascading rinse. The spray head, positioned in a wet well for the demonstration, finished the first 360-degree cycle in 12 minutes. A 6-minute cycle followed to homogenize the grease, which was suctioned into the combination truck.



RESULT

The unit eliminated the need for confined-space entry. Tidewater authorities are staying ahead of grease buildups in their lift stations and providing better service to their customers. The cleaning machine works with standard jetters and combination sewer cleaners. 877/426-2538; www.gamajet.com.

Monolithic product stops I&I

Problem

A deteriorated brick manhole in a busy intersection of Palm Beach, Fla., was surcharged with groundwater and flow from an additional service line. The city needed a quick rehabilitation method.

Solution

SAK Construction of Palmetto used **SprayWall from Sprayroq** to solve the problem. Workers pressure-washed the manhole at 3,000 psi and applied a hydraulic cementitious mortar to create a smooth substrate. They also replaced the bench and trough to ensure a smooth transitional channel for existing flow.

To stop inflow and infiltration, workers drilled 1-inch holes at the points of intrusion, then pumped in acrylamide grout covered by a layer of mortar. They then sprayed the structure with a 125-mil-thick application of **SprayWall**, a monolithic product.



RESULTS

The corrosion- and abrasion-resistant surface extended the manhole's lifespan by up to 50 years. 205/957-0020; www.sprayroq.com.

System replaces manhole chimneys

Problem

The City of Las Vegas bid out a manhole frame adjustment project on The Strip. Rehabilitating the five structures had to be done in one day between 2 a.m. and 10 a.m.

Solution

Harber Co. won the bid. Workers used the **manhole chimney replacement system from Mr. Manhole**.

The circular cutter, powered by a skid-steer, quickly penetrated the street and removed the manhole frames in one hour. The crew rebuilt the chimneys using plastic liners and poured-in-place concrete rings.



RESULT

Traffic was allowed on The Strip by 9:30 a.m. 419/229-3015; www.mrmanhole.com.

Protective coating stops corrosion, infiltration

Problem

The protective coating was failing on two leachate collection manholes at an Ontario landfill, resulting in severe corrosion of the concrete and costly treatment of groundwater.

Solution

City officials hired Liqui-Force Services to rehabilitate the structures. After extensive safety preparation, workers used high-pressure water blasting to expose a solid substrate, then installed a **stress skin panel from SpectraShield** to eliminate corrosion and stop infiltration.



RESULT

Repairs to both structures were completed in less than one week. 800/284-2030; www.spectrashield.com.

Manhole insert prevents dumping

Problem

A 24-inch sewer main in the City of Glendale, Calif., had an off-street manhole vulnerable to dumping. The activity could damage and block a diversion structure immediately downstream of the manhole.

Solution


The Wastewater Division of the Crescenta Valley Water District had **Sewer-Lock install a stainless steel manhole insert**. The district supplied keyed-alike padlocks. Workers rejuvenated the concrete riser rings and installed a sub-ring with anchor bolts. The inner cover releases during an overflow.



RESULT

The insert prevented costly damage to the downstream structure and cleanup from dumping. 408/761-5882; www.sewerlock.com. ♦

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Jodi Glover, CEO and co-founder of REAL TECH, was named the 2012 RBC Canadian Women Entrepreneur of the year for the TPH Sustainability Award by Women of Influence.

Northern Lake Service awards EPA UCMR3 contract

Northern Lake Service was selected to assist the U.S. Environmental Protection Agency with sample analyses for the third Unregulated Contaminant Monitoring Rule (UCMR3). The aggregate contract value is estimated at \$8.5 million. The UCMR3 program is mandated as part of the EPA's Safe Drinking Water Act (SSWA) and affects public water systems that serve more than 10,000 people.

EPA forms Clean Rivers, Green District partnership

The U.S. Environmental Protection Agency, the District of Columbia and D.C. Water formed a partnership agreement to use green technologies for wet-weather pollution control in the district. The Clean Rivers, Green District agreement outlines collaborative steps to support green infrastructure to achieve sustainable stormwater management, more livable communities and other environmental improvements in the district.

Peters wins Tigre sales competition

Douglas Peters, national sales manager-plumbing for Tigre USA, was among 10 winners of the Tigre Group S/A companywide 2012 Fittings Sales Competition. He will join sales representatives from each of the company's international divisions for an all-expenses-paid trip to Brazil, including a tour of the company's headquarters in Joinville and a weekend in Florianopolis.

Perma-Liner receives IAPMO listing

Perma-Liner was awarded the Uniform Plumbing Code Listing from the International Association of Plumbing and Mechanical Officials (IAPMO).



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Webasto, ESW form emissions partnership

Webasto Product North America, designer of engine idle reduction technologies, and ESW Group, provider of emissions control products, formed a partnership that will enable fleets and municipalities to obtain Diesel Emission Reduction Act funding for emission control and idle reduction equipment. Webasto manufactures fuel-operated heaters that eliminate the need to idle for engine pre-heat and cab comfort. ESW's diesel particulate filter removes particulate matter from engine exhaust.

American Water Resources opens operations center

American Water Resources, subsidiary of American Water, opened its expanded operations center in Alton, Ill. Enlarged from 7,972 to 20,427 square feet, the facility includes additional work stations, network room, three coaching rooms, training room and conference room as well as wall monitors for use in meeting and coaching sessions.

Lanzo Trenchless expands services

Lanzo Trenchless Technologies, formerly Lanzo Lining Services, has expanded to provide services throughout North, Central and South America. Established in 1993, the company has installed more than 9 million lineal feet of sanitary sewer, force main, sewer drain, NSF 61 potable water transmission, large-diameter and non-circular cured-in-place pipe lining in North America.

Quadex names regional sales manager

Quadex/InterfitUSA named James Dugger western regional sales manager. He will handle sales and marketing for the company's line of rehabilitation cements and coatings, as well as the Interfit lateral connection sealing system. Dugger has seven years of experience in the underground infrastructure corrosion protection, rehabilitation and trenchless industry.

US Holdings becomes Eagle Manufacturing Group

US Holdings launched Eagle Manufacturing Group as the new name for its collection of municipal construction and manufacturing products and services. The name is intended to bring clarity to the company's corporate structure and the relationship of the parent company to its operating companies: US Foundry and Manufacturing Corp., USF Fabrication, United Concrete Products and Eagle Processing & Recycling.

USB-Sewer Equipment names sales manager

USB-Sewer Equipment Corp. named Leighton White sales manager for the West Coast. He has 23 years of sales, marketing and management experience within the sewer industry. White will be responsible for sales, service and customer support in California. ♦

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Product Spotlight

Vanair combines six forms of power in one unit

By Ed Wodalski



Air N Arc I-300 All-In-One Power System from Vanair

Designed for convenience, fuel savings and safety, the Air N Arc I-300 All-In-One Power System from Vanair combines six forms of power in a single unit. The 41-inch wide by 47-inch long by 33-inch tall power system fits behind the cab or mounts on the side pack of a vehicle, offering full functionality with the truck engine off.

“The largest application where it is used is a service truck with a hydraulic crane,” says Dean Strathman, vice president of above decks at Vanair. “Municipal applications have also used the power of the machine to run hydraulic hand tools, hydraulic trash and water pumps and a valve exerciser.

“This product was designed to meet the challenges of the new EPA and Tier 4 regulations and deliver an efficient solution to the increasing cost of fuel,” Strathman says. “Many trucks compliant with Tier 4 emissions do not operate as efficiently at idle as they do at high speed; running at idle tends to plug up the diesel particulate filters. The Air N Arc I-300 allows for operation of services without the need to adhere to vehicle regulation because the vehicle is no longer burdened as the driver application.”



In 2008, Strathman says they began seeing people going to smaller GVW vehicles in an attempt to reduce weight. “So combination units as a whole became a large focus for us,” he says. “And in going to smaller vehicles, space became a consideration. It’s been the evolution of the industry that has driven this product.”

The power system has a 40 cfm (high-speed, 30 cfm at idle) rotary screw compressor; 6,800 continuous-watt AC generator with 120-volt GFCI and 240-volt outlets; 300-amp welder (CC/DC, VC/DC); 300-amp, 12- and 24-volt battery booster; 12-volt battery charger; and 10.5 gpm hydraulic pump (3,000 psi maximum pressure).

A key safety feature is the unit’s remote control panel, which enables users to operate the power system from the curb, free of traffic, and eliminates the need to jump in and out of the truck cab. The panel is available with 6 to 26 feet of tethered control cable, as well as custom lengths.

The power system is also available as a stand-alone unit with fuel tank and hydraulic reservoir on a single platform for added portability. **800/526-8817; www.vanair.com.**



Smith Flow Control portable valve actuator

The Easi-Drive portable valve actuator from Smith Flow Control enables one user to operate multiple valves with a single tool while reducing fatigue and injury risk. The tool, which can be powered by air, electricity or battery, is effective on valves that require a high number of turns or are otherwise difficult to operate because of high torque or location. **859/578-2395; www.smithflowcontrol.com.**



Endress+Hauser optical absorption sensor

The OUSAF11 sensor for measuring optical absorbance by a process fluid from Endress+Hauser uses visible and near-infrared wavelengths of light. Designed for product loss detection, interface detection, suspended solids and turbidity measurements, the sensor is available in an immersion model for use in open tanks and basins or in insertion models with Tri-Clamp or Varivent connections that meet 3A Sanitary Standards. The sensor can be operated continuously up to 194 degrees F and up to 266 degrees F for two hours. **888/363-7377; www.us.endress.com.**



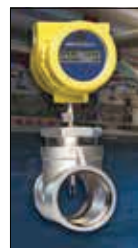
Ditch Witch SK750, SK755 tool carriers

SK750 and SK755 tool carriers from Ditch Witch feature 25 hp or 32.8 hp Kubota diesel engines and accept 70 attachments. The carriers provide 800 pounds of lift capacity, 81-inch lift height and high-drive track system with bolt-on sprockets, wide-track rollers and replaceable spindles. The carrier has an optional single-level joystick control and two-way auxiliary control foot pedal for attachments. **800/654-6481; www.ditchwitch.com.**



FCI air/gas flowmeter

The ST75 air/gas mass flowmeter from Fluid Components International delivers flow measurement while reducing the consumption of energy fuel gases, specialty gases and pneumatic air. When installed with multiple gas compressors, the meter enables operators to compare compressor usage and adjust for optimum efficiency. The meter is designed for line sizes from 0.25 to 2 inches. **800/854-1993; www.fluidcomponents.com.**





Optronics stop, tail, turn lamps

The GloLight series of LED stop, tail and turn lamps from Optronics International features a smoothly illuminated outer band surrounding a central LED array that remains unlit during standard operation. Available in 4-inch round and 6-inch oval sizes, the lamps meet FMVSS 108

and SAE photometric requirements for visibility and safety. Lens and housings are made of sonically welded polycarbonate material. The lamps have a solid-state, surface-mount device that protects the electronics against moisture, shock and vibration. **800/796-8909; www.optronics.com.**

SJE-Rhombus lift station control panel

The 331 Lift Station control panel from SJE-Rhombus is designed for standard duplex applications, covering three phases (up to 32 amps each) and three voltages (208, 240, 480) with one panel. It is available in stainless steel or fiberglass wall-mounted enclosure and features single-point power connection, IEC hp rated motor starter with adjustable overload module, Class 10 ambient compensated overload relay, tri-voltage step-down control transformer and separate alarm/control fuses.



888/342-5753; www.sjrhombus.com.

KROHNE Optiflex C/F level meter

The Optiflex 2200 C/F level meter for liquids and solids from KROHNE features software-based dynamic parasite rejection technology that eliminates false reflection caused by environmental disturbances and product buildup. The two-wire device for tank and silo applications is available with a variety of probes to measure liquids up to 137 feet and solids up to 66 feet in temperatures to 570 degrees F and pressures to 580 psig.

800/356-9464; www.us.krohne.com.

Bingham & Taylor valve box sealed system

The Buffalo no vac valve box sealed system from Bingham & Taylor Corp. features valve box stabilizer and debris trap (available together or separately). The stabilizer fits all round valve box bells and bases. Designed for use with cast iron or plastic valve boxes, the stabilizer prevents the intrusion of dirt, backfill or sand from below. The debris trap eliminates maintenance and service issues caused by debris intrusion through and around the valve box cover over time. **540/825-8334; www.binghamandtaylor.com.**



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Omega DC current data logger

The OM-CP-PROCESS101A DC current data logger from Omega Engineering has a 10-year battery life, 4 Hz reading rate, multiple start/stop function, high-speed download, 1-million-reading storage capacity, memory wrap, battery life indicator, optional password protection, and programmable high and low alarms. The data logger is available in 20mA and 160mA input ranges. **800/826-6342; www.omega.com.**



Guardair worker cleaning station

The Personnel Cleaning Station vacuum from Guardair Corp. is designed to clean dust, powders and debris off worker clothing, eliminating self-cleaning with compressed air and providing compliance with OSHA directive STD 01-13-001 that prohibits the use of a gun, pipe or cleaning lance for self-cleaning. The unit weighs 13 pounds and includes a 5.5-gallon container, pre-drilled mounting bracket, 10-foot hose and air-agitator brush. **800/482-7324; www.guardaircorp.com.**



General Pipe handheld inspection tool

The Gen-Eye Micro-Scope handheld inspection tool from General Pipe Cleaners has a 39-inch probe rod for hard-to-reach areas. The monitor attaches to the reel with an adjustable mount. The reel carries up to 100 feet of micro pushrod with color camera for inspecting 1 1/2- to 3-inch drain lines. Other features include 3.5-inch LCD screen, built-in SD card reader with one-touch record button, digital zoom, rotatable picture, voice-over recording, LED brightness control, USB port and on-screen status indicators. **800/245-6200; www.drainbrain.com.**



Festo automated mini controller

The CECC mini controller with IO-Link master and CoDeSys V3 from Festo Corp. is designed to reduce installation times and simplify programming for small- to mid-sized treatment systems. Able to handle electric and pneumatic automation tasks, the four-channel device can be integrated into higher-level systems. **800/993-3786; www.festo.com.**



Metabo rotary hammer

The KHE 3250 1 1/8-inch SDS-Plus rotary hammer from Metabo Corp. has a LongLife 7.2 amp motor, providing 0-4,470 blows per minute at a force of 0-3.1 joules per blow and a no-load rpm of 0-1,150. Drilling capacity is 1 1/8 inches in concrete using solid bits, 3 1/8 inches in brick using thin wall core bits, 1/2 inch in mild steel, and 1 3/8 inches in softwood. **800/638-2264; www.metabousa.com.**



Sage thermal mass flowmeter

The RIO ATEX Zone 1 thermal mass flowmeter from Sage Metering features the In-Situ field zero calibration check, wide turndown, drift-free operation, high-contrast graphical flow rate display and explosion-proof, dual-sided NEMA 4X enclosure. Flow rate also is displayed graphically in a horizontal bar graph format. The meter is powered by 24 VDC (115 VAC/230 VAC optional). **831/242-2030; www.sagemetering.com.**



Graphic Products pipe marking guide

The free DuraLabel wastewater treatment pipe marking guide from Graphic Products provides a standard color coding system to identify pipe contents. **888/326-9244; www.graphicproducts.com**



Badger E-Series ultrasonic meters

The E-Series of ultrasonic meters from Badger Meter is designed for water metering applications, using ultrasonic transit time technology to calculate flow rate and total consumption. With no moving parts, the internal battery powers the meter up to 20 years. Lead-free compliant with NSF/ANSI standards, the meter's stainless steel housing is available in 5/8, 5/8 by 3/4, 1, 1 1/2 and 2 inches. Electronics are contained in a weatherproof, UV-resistant housing for residential and commercial applications. **800/876-3837; www.badgermeter.com.**



Hach portable flowmeter

The FH950 portable flowmeter with electromagnetic sensor from Hach Co. is available with depth and velocity or velocity only. Features include step-by-step user interface, real-time data and direct-to-PC downloads. The meter automatically calculates total discharge based on USGS and ISO methods. Real-time velocity is graphed on a color display. **800/368-2723; www.hachflow.com.**



KSB gate valve with pressure seal

The ZTS gate valve with pressure seal bonnet from KSB has a hammer-forged steel body, enabling it to handle water, steam, gas, oil and other non-aggressive fluids at temperatures up to 1,200 degrees F and pressures to 8,700 psi. **804/222-1818; www.ksbusa.com.**

Aquatech enhanced membrane bioreactor

The Aqua-EMBR enhanced membrane bioreactor for wastewater treatment from Aquatech uses an activated sludge extended aeration biological treatment process and ultrafiltration membrane system for the separation of activated sludge from treated effluent. The UF membrane is positioned outside the bioreactor tank, rather than submerged in the tank or in the downstream membrane tank. The design reduces much of the feed pump energy required to maintain high crossflow velocity. **724/746-5300; www.aquatech.com.**



RIDGID soil pipe cutter

The 238-P powered soil pipe cutter from RIDGID cuts soil pipe in hard-to-reach places, including rafters or below grade. Weighing 13.5 pounds and measuring 11.5 inches long, the cutter is designed for use with a 1/2-inch impact driver. The chain cuts no-hub cast iron, service weight cast iron and clay pipe up to 8 inches in diameter and concrete pipe up to 6 inches in diameter. Two-direction operation enables the user to score pipe before cutting, while the torque limit protects against overloading. **800/769-7743; www.ridgid.com.**

Videx Vault 20 key control cabinet

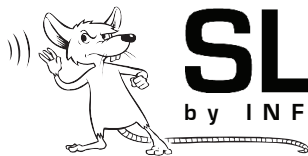
The CyberKey Vault 20 FX key control cabinet from Videx features weatherized input modules and an embedded Flex System Hub for improved performance. The vault is designed to manage, program and dispense CyberKey smart keys, programming keys with individualized access privileges for each user. **541/738-5500; www.videx.com. ♦**



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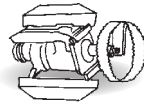
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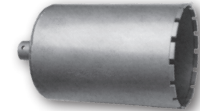
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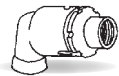
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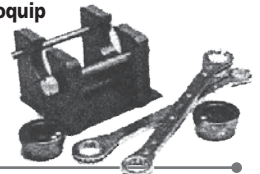


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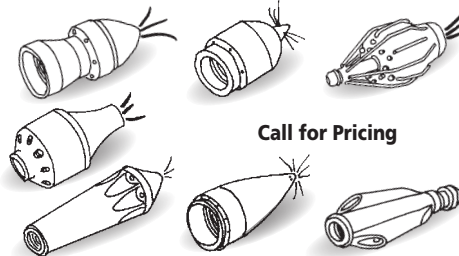
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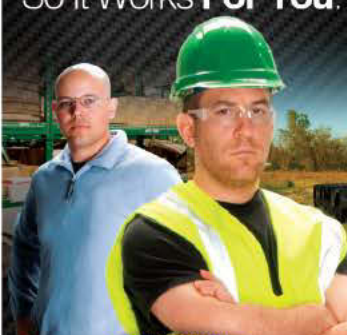
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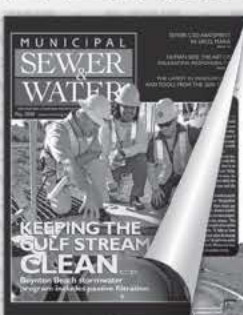
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CCTV Operator Infrastructure Services Department Public Works Branch Posting No. 129(859). Is responsible for the inspection and condition coding of sanitary and storm sewer lines used in the annual planning of sewer preservation programs. \$25.68 to \$26.99 per hour (2012 rates). 306-975-3261. (M04)

POSITIONS AVAILABLE

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

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TV INSPECTION

2012 CUES Lamp II Lateral Launcher. 1-year-old lateral launch camera and accessories for sale. Excellent condition. \$55,000. Call 760-828-5347. (M04)

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PO Box 220, Three Lakes, WI 54521

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PEOPLE/AWARDS

Jim Schwing, vice president at CH2M HILL, was named 2012 Engineer of the Year by the American Council of Engineering Companies of Utah. The honor recognizes not only Schwing's technical excellence and work on critical water infrastructure projects in Utah, but also his ability to balance responsibilities of service to his fellow employees, the community and the engineering profession.

Cape Fear Precast LLC in Jacksonville, N.C., was awarded second place in the National Precast Concrete Association's CUP Awards for a weir it built for the Jack Smith Creek Stormwater Project. The 42-acre project in New Bern is among the largest stormwater retrofits built in the state.

The **Hopkinsville Surface and Stormwater Utility** was awarded the Kentucky League of Cities Enterprise City Award for the construction of the Woodmont Basin System.

David Bernier, superintendent of the North Conway Water Precinct in New Hampshire, was awarded the 2012 Operator of the Year Award by the Granite State Rural Water Association.

MSW welcomes your contribution to this listing. Please send notices of new hires, promotions, service milestones, certifications or achievements to editor@mswmag.com.

CALENDAR

April 7-10

American Public Works Association North American Snow Conference, Charlotte Convention Center, Charlotte, N.C. Visit www.apwa.net.

May 13-15

American Public Works Association Sustainability in Public Works Conference, San Diego Sheraton Hotel & Marina, San Diego. Call 800/848-2972 or visit www.apwa.net.

June 9-13

American Water Works Association Annual Conference and Exposition (ACE 13), Denver. Visit www.awwa.org.

June 12

American Public Works Association-Washington State Chapter Northwest FOG Forum, Greater Tacoma Convention & Trade Center, Tacoma, Wash. Visit www.apwa-wa.org/chapter.

July 21-24

American Society of Agricultural and Biological Engineers, Kansas City, Mo. Visit www.asabe.org.

Aug. 18-22

StormCon: North American Surface Water Quality Conference and Exposition, Myrtle Beach Convention Center, Myrtle Beach, S.C. Visit www.stormcon.com.

Aug. 25-28

American Public Works Association International Public Works Congress & Exposition, McCormick Place, Chicago. Call 816/595-5241 or visit www.apwa.net.

LEARNING OPPORTUNITIES

American Water Works Association

The AWWA has these courses:

- April 22-24 – Financial Management: Cost of Service Rate-Making Seminar, online
- May 8-9 – Inspection and Assessment of Dams, Seattle
- Sept. 8-12 – Dam Safety 2013, Providence, R.I.

Visit www.awwa.org.

National Utility Contractors Association

NUCA has a Train the Trainer: Excavation Competent Person Instructor Training seminar on April 20 (location TBA). Visit www.nuca.com.

Wisconsin

The Wisconsin Department of Natural Resources has a Pumps and Motors course May 7-9 in Madison. Visit <http://dnr.wi.gov>.

The University of Wisconsin Department of Engineering-Professional Development has these courses:

- April 8-9 – Using WinSLAMM v. 10: Meeting Urban Stormwater Management Goals, Madison
- May 1-3 – Using HEC-HMS to Model Watersheds, Madison
- May 6-8 – Using HEC-RAS to Model Bridges, Culverts and Floodplains, Madison
- Oct. 14-15 – Using WinSLAMM v. 10: Meeting Urban Stormwater Goals P010, Madison

Visit <http://epdweb.engr.wisc.edu>. ♦

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



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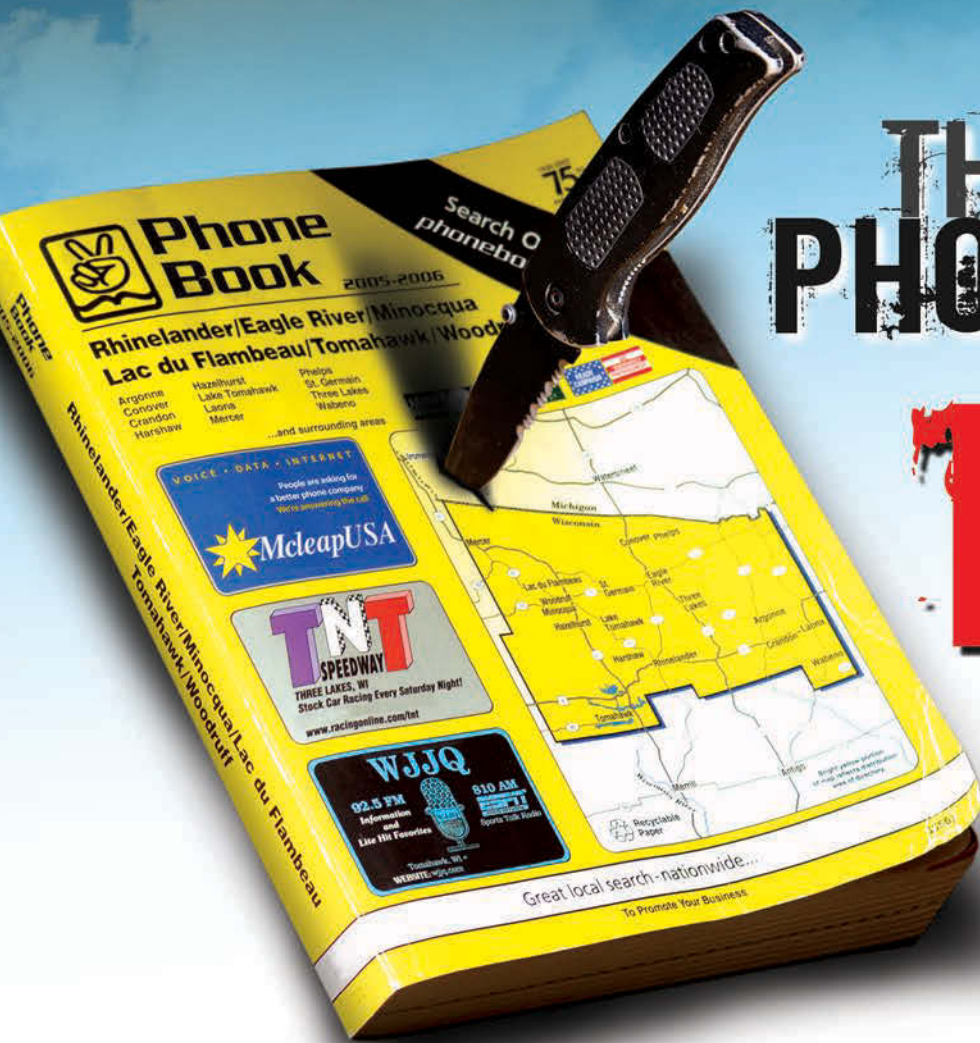
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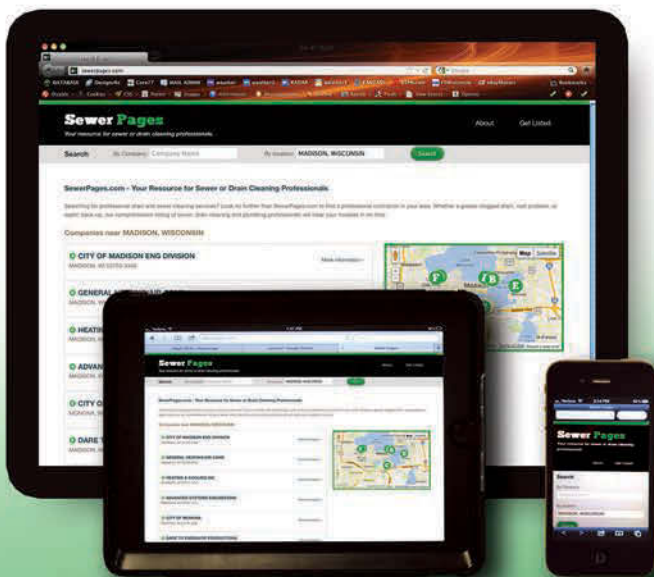
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