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Julia Hunt  
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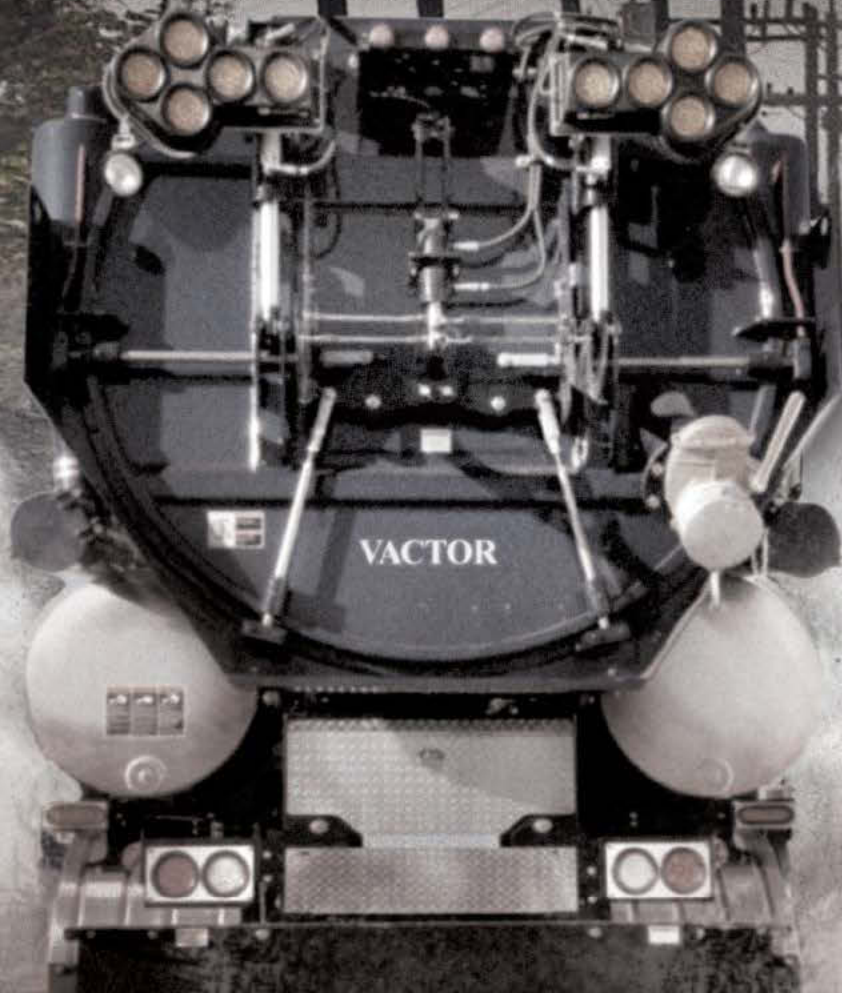
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# INSIDE:

## PIPELINE REHABILITATION AND RELINING



**COVER:**  
Julia Hunt and her team at the Arlington (Texas) Water Utilities Department are early adopters of technology. As early as the mid-1990s, the department electronically cataloged its sewer and water systems. Today, there's a database that can produce a computerized ranking for any length of pipe and provide guidance on which assets most immediately need repair. (Photography by Glen E. Ellman)



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# SECOND RATE?

A new report indicates that the United States is falling seriously behind the rest of the world in quality, leadership and vision on infrastructure

**B**ad grades on an infrastructure report card are disturbing. Having the United States called “second rate” in terms of infrastructure is, or should be, downright alarming.

That very phrase appears in connection with a new infrastructure survey released in October by CG/LA Infrastructure, based in Washington, D.C. The Country Infrastructure Capacity (CIC) Survey scores countries’ capacity to develop infrastructure projects, ranking them from 1 to 10 on eight areas that are basic to project development.

“Overall,” said a CG/LA press release on the results, “the scores suggest that the U.S. is falling into second-rate status in the infrastructure arena, becoming a country that does not attract top-flight expertise or resources to its infrastructure business. In particular, responses on questions about leadership and vision yielded lower scores than any previously surveyed country.”

## On par with Peru?

Norman Anderson, president and CEO of CG/LA, observed, “We have conducted this survey around the world, and the overall results for the U.S. are some of the lowest scores that we have seen. U.S. scores are on par with Peru, in terms of the country’s ability to develop infrastructure projects, and well below those of Brazil, India, China and other countries with which we compete for scarce infrastructure dollars and expertise.”

The U.S. total score (sum of the scores for all eight areas surveyed) was 43.8, versus, for example, 50.8 for Brazil and 51.3 for India. Here are the U.S. scores for the individual categories (scores below 7 indicate failing grades):

- Overall vision, 3.5
- Public sector technical capacity, 4.95
- Public sector strategic capacity, 4.45
- Great projects, 6.64
- Leadership, 4.18

- Long-term project performance, 6.43
- Engineering, procurement and construction firms, 7.62
- Local equity capacity, 6.05

## Other views

Meanwhile, the debate in the halls of Congress and in statehouses around the country seems to be about all the things we can “no longer afford.” Have some of our leaders decided that infrastructure investment is one of those things?

**“We have conducted this survey around the world, and the overall results for the U.S. are some of the lowest scores that we have seen. U.S. scores are on par with Peru ...”**

Norman Anderson

CG/LA is not the first entity to sound an alarm. The American Society of Civil Engineers’ most recent *Report Card for America’s Infrastructure* gave the nation an overall grade of D and noted the need for a five-year investment of \$2.2 trillion from all levels of government and the private sector. Wastewater infrastructure received a D grade, and drinking water a D-minus.

“Decades of underfunding and inattention have jeopardized the ability of our nation’s infrastructure to support our economy and facilitate our way of life,” the ASCE observed. “Since ASCE’s last assessment in 2005, there has been little change in the condition of the nation’s roads, bridges, drinking water systems and other public works, and the cost of improvement has increased by more than half a trillion dollars.”

## Seeing the benefits

Another recent report emphasized the potential benefits of investing in infrastructure. *Water Works: Rebuilding Infrastructure, Creating Jobs, Greening the Environment*, was released in October by Green For All, in partnership with American Rivers, the Economic Policy



## FROM THE EDITOR

Ted J. Rulseh

Institute, and the Pacific Institute. It estimated that upgrading the nation’s water and wastewater infrastructure could create nearly 1.9 million jobs and add \$265 billion to the economy.

The report looks at an investment of \$188.4 billion in water infrastructure — the amount the U.S. EPA says it would take to manage stormwater and preserve water quality. It says that investment would create nearly 1.3 million direct and indirect jobs in related sectors and lead to 568,000 more jobs from increased spending.

“We find that our decaying water infrastructure pollutes our waters, sickens our children, and wastes natural resources,” the report’s authors state. “Every year, sewer overflows contaminate U.S. waters with 860 billion gallons of untreated sewage, an amount that could fill 1.3 million Olympic-size swimming pools or cover the entire state of Pennsylvania with one inch of sewage.”

“Total public investment in water infrastructure as a share of the economy is estimated to have fallen by over one-third since peak levels of investment in 1975. As new challenges emerge and systems deteriorate further, we are seeing a growing gap between our clean water needs and annual investment.”

In comparison against other approaches to job creation that have been proposed, the report states, “Infrastructure investments create over 16 percent more jobs dollar-for-dollar than a payroll tax holiday, nearly 40 percent more jobs than an across-the-board tax cut, and over five times as many jobs as temporary business tax cuts.”

## The time is when?

So, where exactly is the downside to infrastructure investment? Does our nation really want to become “second rate”? What is it going to take to start this ball rolling? Exactly when is the right time? Signs seem to indicate the time is now. ♦





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# BACK ON TRACK

Proactive maintenance, sound processes and modern software help the city of Longview put its water and sewer infrastructure on sound footing

By Pete Litterski

**S**ixteen years ago, the wastewater collection system in Longview, Texas, was aging badly. The city had been financing maintenance and line replacement with bonds rather than regular revenue, and the capacity and condition of its infrastructure were becoming problems.

In 1995, the city council authorized funding for a consultant study of the wastewater system and the development of a 15-year master plan for the rehabilitation of the infrastructure. Four years later, the council approved a similar process for the city's water supply system. In addition to finding extensive problems with damaged sewer lines, "The first study reflected a lot of lines under capacity," recalls Rolin McPhee, assistant director of public works.

In 2008, the city authorized a follow-up study as part of a 20-year wastewater facilities plan. It showed some lines that needed possible upgrades in the near future, but generally reflected the need for

proactive maintenance, rather than recovery. "It's more of what you'd see for a growing city that needs to improve capacities and maintain its assets, instead of what you'd see for an aging system with a lot of problems that need replacement," McPhee says.

In other words, Longview's Public Works Department had resolved the most serious problems identified by the original study more than 15 years ago — by sticking to the original master plan, aggressively repairing and replacing substandard and damaged lines, and being more proactive about maintenance, with help from a new software tool.

## Making a commitment

Longview is a growing East Texas city with 78,000 residents, up more than 10 percent since the 2000 census. Now that the city's infrastructure is in generally solid shape, the Public Works Department can focus on maintaining the system. The staff does that with a proactive approach to main-



From left, maintenance workers James Pegues and Damien Reese and crew leader Vernon Jackson send a jetter nozzle into a residential sewer. (Photography by Pete Litterski)

tenance, beginning with close attention to service calls.

The department's three collection/distribution supervisors are expected to work closely with employees to track repair records and identify recurring problems that could be the symptoms of larger breakdowns in the system.

When crews return to a problem line or a neighborhood on repeat calls, supervisors decide what the next step will be. They check the records to determine the frequency and severity of a problem and look at any video taken by repair crews who have access to the department's three SeeSnake push cameras (RIDGID).

Armed with that information, they decide whether to dispatch the city's GapVax MC-2008 combination truck to jet the mainlines

## PROFILE:

City of Longview, Texas, Public Works Department

FOUNDED: 1870

POPULATION: 78,000

AREA SERVED: 54.7 square miles

INFRASTRUCTURE: 643 miles of sewer lines, 672 miles of waterlines

ANNUAL BUDGET: \$32.66 million (water and sewer operations)

WEBSITE: [www.longviewtexas.gov](http://www.longviewtexas.gov)

and inspect them with the department's tractor-mounted camera system (RapidView IBAK). They can compare the new video with the history of problems identified during past work.

(continued)

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The Longview team includes, from left, James Pegues, maintenance worker; Brian Richardson, supervisor; Joel Howard, equipment operator; Vernon Jackson, crew leader; Wayne Krc, supervisor; and Damien Reese; maintenance worker/camera operator, with the city's GapVax combination truck.



From left, Danny Bogue, private consultant and retired manager of water distribution/wastewater collection; Rick Evans, manager of water distribution/wastewater collection; and Rolin McPhee, assistant director of public works.

## FIRST ON THE SCENE

When the Longview Public Works Department put a high priority on rapid response to sewer line service calls, former water distribution/wastewater collection manager Danny Bogue saw a need to give the crews better equipment.

Bogue, now retired and working as a private consultant, proposed a concept the department calls hot shot trucks, akin to the vehicles commonly dispatched to the East Texas oil fields when well operators need emergency supplies or services.

The city council approved the proposal and the Public Works Department bought three Ford truck chassis. City employees outfitted them with 950-gallon water tanks, Giant pumps and jettors from PipeHunter. The trucks augment the work of the department's GapVax combination truck, which carries a 2,000-gallon water tank and 8-cubic-yard debris tank.

Employees on hot shot trucks are first responders for sewer repairs. "As soon as a call comes in from a resident, the hot shot driver is the first person to come in on a problem," says Rick Evans, who succeeded Bogue. "Sometimes they can resolve the problem, and sometimes it's just a temporary fix. If we are called several times, the GapVax unit goes in and washes it out and the camera goes in right after that to see what the source of the problem really is."

Rolin McPhee, assistant director of public works, says other cities have been impressed with the hot shot concept. "People have actually copied that design from us" as an economical way to extend their fleets, he says.

Last summer, the city modified its approach with a decision to buy a more compact system on a utility trailer. Evans says that unit will give crews better access to off-road sites where lines run down unpaved easements. The trailer can be pulled by the department's four-wheel-drive pickup trucks, which can travel rough terrain and through off-road tight spots.

**"One of our supervisors can enter a query to find out where we've been five times in the past two years with our wash truck. They can get a list and start doing work orders to TV this line and TV that line. That way we make the best use of our crews and our equipment."**

Rolin McPhee

At that point, they decide whether to recommend immediate major repairs or replacement, or addition of the line section to the city's annual maintenance plan.

### From the bottom up

McPhee says the annual maintenance plans for the wastewater collection and water distribution systems are a bottom-up process that begins with supervisors talking to field crews about problem areas they have noted during the past year. Those conversations begin early each summer. Supervisors compile the information and add it to data they acquire through queries of the city's database.

The assessment generally

follows the timeline of the city's budget process for a fiscal year that begins Oct. 1. As the supervisors compile their reports and data, they begin a series of meetings with water distribution/wastewater collection manager Rick Evans to discuss their assessments and begin listing assets they believe should be scheduled for major maintenance, rehabilitation or replacement in the coming year.

The list of proposed projects is then turned over to the department's engineers, who meet with the supervisors, review the data and watch the video before compiling a final plan of action for the next year's maintenance program.

*(continued)*



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**Maintenance worker James Pegues lowers a tractor-mounted camera from RapidView into a manhole to inspect a root-clogged line.**

On the water side, the focus is on the long-term replacement of smaller waterlines serving residential areas. McPhee says modern codes and the added demands placed on water supply lines make the original 2-inch lines in many residential neighborhoods obsolete. “We’re systematically trying to replace lines that were under 6 inches with 6-inch lines,” he says.

In addition to upgrading the waterlines in many neighborhoods, Longview crews keep a close eye on the condition of the city’s older iron pipes — nearly 270 miles of the city’s 674-mile waterline network are ductile or cast iron. Corrosion has long been a problem in Longview due to the conductivity of the region’s iron-rich soil and the presence of an extensive net-

work of pipelines connecting the many active oil and gas wells inside the city limits.

For the 2011-12 budget cycle, the department allocated \$700,000 each to the wastewater collection and water distribution systems for the annual maintenance and replacement program. The city launched a plan several years ago to increase annual maintenance budgets by \$100,000 per year until they reach \$1 million each for water and sewer.

### **A new tool**

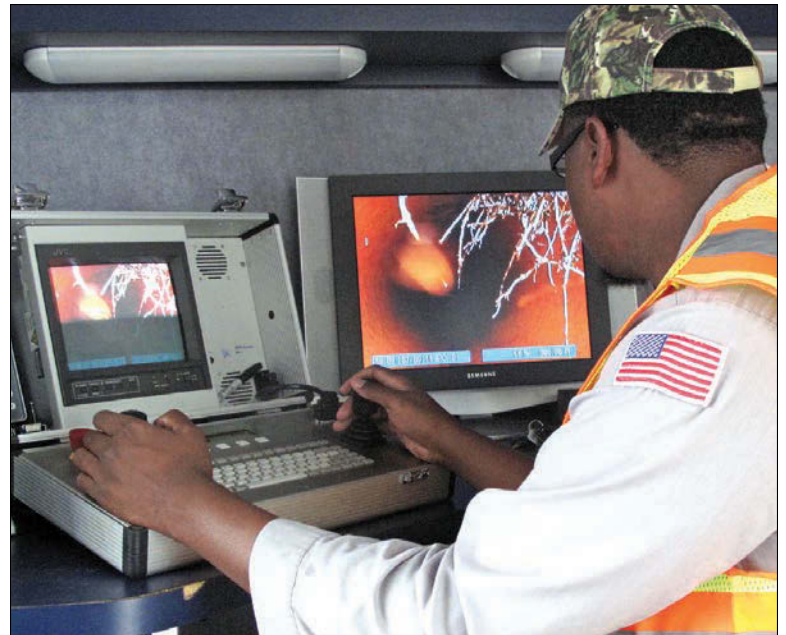
One newer tool the department uses for day-to-day operations and maintenance planning is Cityworks software from Azteca Systems. Several years ago, department employees worked with aging software in five databases, and using that system was inefficient and often difficult. “We decided we needed something that worked better for us,” says Justin Cure, GIS manager.

Cure had already developed the city’s GIS program, creating extensive files of data and video records about the location, condition and capacities of the infrastructure. However, he says, the city was not tapping the full potential of its growing storehouse of information.

That’s why in 2009 Longview added the Cityworks software as a plug-in module for its GIS. It is a work order management system that, in McPhee’s words, “sits inside the GIS. From a maintenance standpoint, that’s the piece we didn’t have.”

Although the principal end product of the software is a work order, employees throughout the department find it useful in day-to-day operations. For J’Nell Smelley, one of three collection/distribution supervisors, the system has simplified the planning of meter reading routes. The software’s ability to access and track data also has been helpful in the city’s meter replacement process.

Two decades ago, Longview replaced all its water meters in a distribution system riddled with inaccurate, often nonfunctioning meters. Now, McPhee says, the goal is to replace 10 percent of the city’s meters each year, and Smelley is deeply involved in a program to install new radio frequency meters



**Camera operator Damien Reese studies an image from a sewer line after it has been jettied.**

**“We were going off of people’s memories — the immediate past rather than documentation of what has happened over time. Now you can say, ‘Give me a list where we’ve been to make repairs six times,’ and, boom, there you have it.”**

**Rolin McPhee**

that will speed up monthly meter readings and improve the city’s ability to track and pinpoint problems.

Smelley says the combination of the new meters and the software will allow the Public Works Department to spot unusual usage and become more proactive in working with customers who have high-bill complaints.

### **Relying on data**

A key advantage crews are finding in the new system is the ability to focus on problems identified by using accurate records rather than relying on human memory and judgment. “One of our supervisors can enter a query to find out where we’ve been five times in the past two years with our wash truck,” McPhee says. “They can get a list and start doing work orders to TV this line and TV that line. That way we make the best use of our crews and our equipment.”

The system also helps long-time employees share valuable information about the city’s distribution and collection systems. “Our maintenance crews had their own

maps, their own paper books that they would keep,” McPhee says. The books contained everything from information on problem locations and past work completed to deviances in the location of assets. Now, through Cityworks, the maps information can be made readily available to everyone.

The ability to track work orders for recurring problems helps the city take preventive measures. “For example, we can track down places where we’ve had problems with grease,” McPhee says. “It can help us pinpoint a possible source and decide what steps to take. It can lead to possibly some public education about what should and shouldn’t go down the drain. In some areas, we may find the answer is to put in drip buckets with enzymes to break down the FOG.”

### **Customer service**

The Public Works Department heavily emphasizes customer service, and a sound process makes it nearly impossible for a service request to fall through the cracks. The process begins as soon as a phone is answered. Office person-

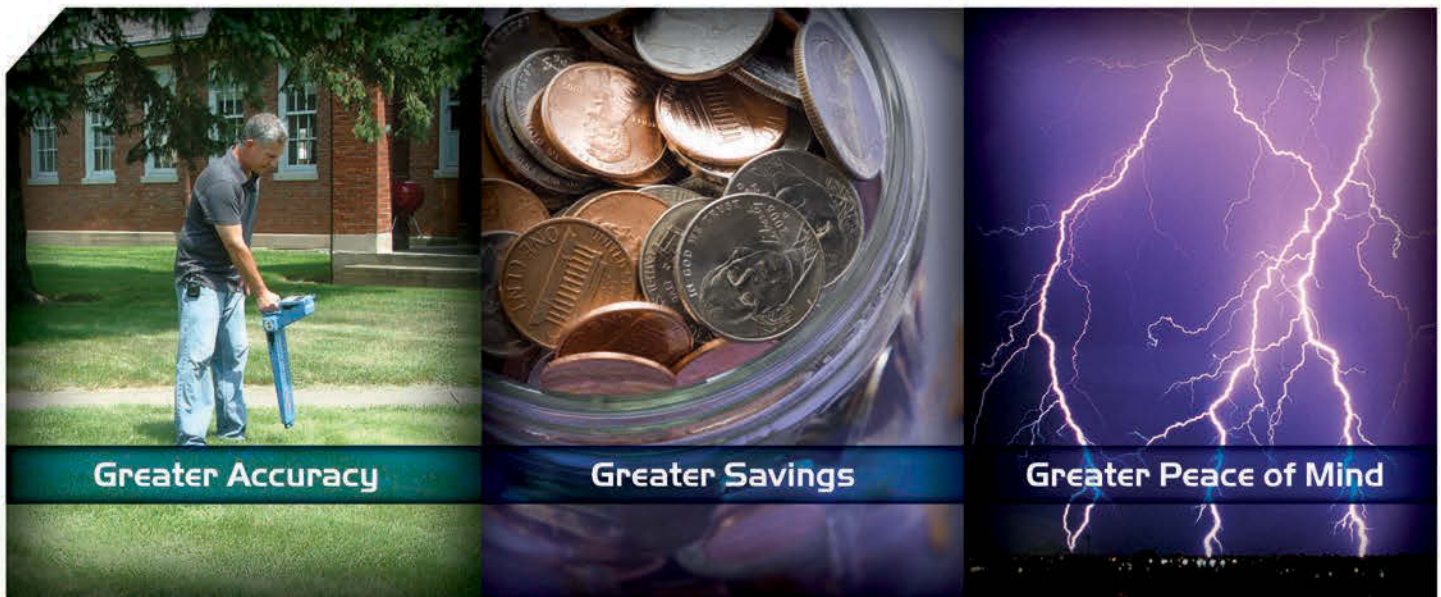
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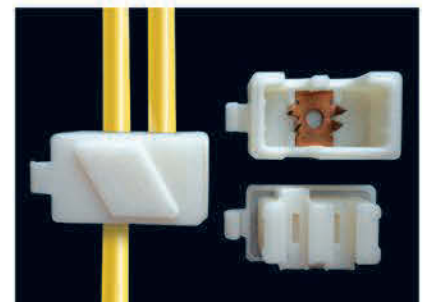
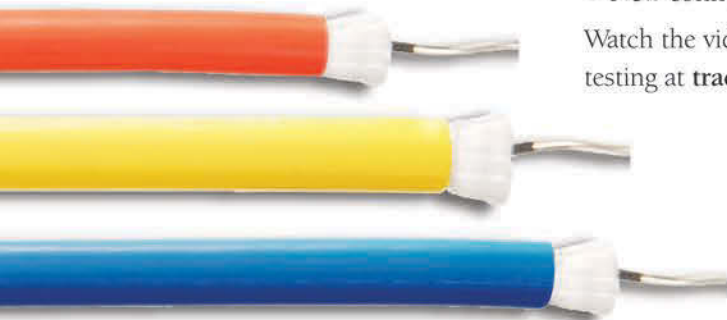
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nel open a service request form on their computer as soon as they begin taking information from a caller.

Emergency requests are routed immediately to a supervisor, while general requests join a queue that supervisors review each morning. After reviewing active service requests, the supervisors prioritize each situation and then assign work orders to maintenance crews. The service requests remain active in the digital queue until someone signs off that the work has been completed or the problem has otherwise been resolved.

Smelley and the other two collection/distribution supervisors usually check the open service requests in the morning and at the end of the day, "so we can track and get a picture of what's going on out there."

The supervisors also use the new work order system to track resources. When a work order is assigned to the maintenance department, the information is also sent to the public works warehouse, where necessary parts and supplies are pulled and waiting for the workers before they go into the field. The system also tracks inventories, allowing the warehouse staff to track and restock necessary parts and supplies.

## Pinpointing issues

The tracking capabilities allow the department to plan its maintenance program on a more scientific basis. "We were going off of people's memories — the immediate past rather than documentation of what has happened over time," McPhee says. "Now you can say, 'Give me a list where we've been to make repairs six times,' and, boom, there you have it.

"In the past, we had the records,

and you could pinpoint problems like that after a lengthy process, but you really couldn't get a good visual of it over the entire system. Now we can ask that question, and right away we can get a map back that pinpoints problem spots."

Combine the ability to literally see those problems with a commitment to resolve them quickly, and McPhee says the city is in a much better position than it was in the 1990s.

"We're just three years into that new 20-year master plan and the work is never done," he says. "But the master plan is much less daunting because we've corrected our deficiencies and our system can focus on the future instead of the problems of the past." ♦

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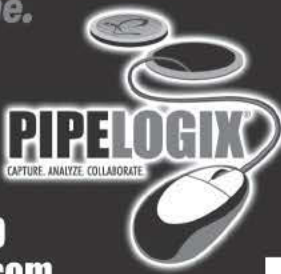
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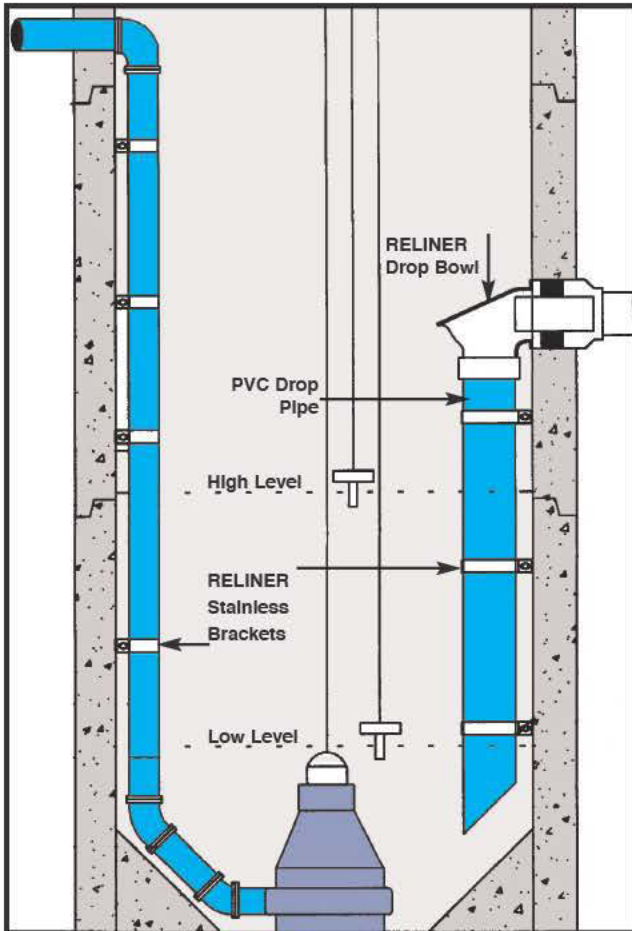


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Crew members Troy Ihlen, left, and Ryan Welander set up the remote sending and receiving unit for the Kleen-Vue system at the opposite end of a segment from the truck and trailer. (Photography by Patrick Lennox Wright)

**FOCUS: STORM**

# NEW PARADIGMS

Innovations including a new cleaning and inspection system are vital to the City of Tacoma's award-winning stormwater management program

By Greg Northcutt

**L**ast May the City of Tacoma (Wash.) Public Works began an ambitious project to inspect the condition and sediment load in every foot of the city's 10-inch or larger storm sewer pipes. That's more than 2 million linear feet in all.

Using a combination of hydraulically powered equipment and wireless technology, the staff plans to finish the inspection in just four years. That's at least 25 years faster than crews would need to do the job using conventional practices, according to Rick Fuller, a senior environmental specialist with the department's surface water section. The inspection is also expected to cost one-fifth as much.

"In these times of increasing competition for utility funds, efficiencies like that are especially significant," says Fuller, who is in

charge of the inspection process, called the Stormwater Rapid Assessment Program (STRAP).

This project, the first of its kind in city history, is part of an asset management program to improve the efficiency of rehabilitating and replacing the stormwater conveyance system. Dating back more than a century, the system serves more than 66,000 surface water accounts in this Puget Sound community of nearly 200,000, located at the foot of Mount Rainer.

The system includes more than 11,000 manholes, 18,000 storm drains and more than 600 outfalls, some discharging into Commencement Bay, which forms the city's deepwater port and much of its waterfront.

**A new standard**

As part of STRAP, Public Works has adopted technology developed

in Germany to inspect municipal storm systems in Europe. Tacoma is the first city in the United States to use the Kleen-Vue system. It includes two digital cameras, operated by a water-powered generator and mounted on a water-propelled sled.

Images from the camera are transmitted wirelessly to a monitor, where the operator can view the pipe for cracks, breaks, root penetration and other defects or illicit connections. A two-person Tacoma crew has been able to inspect up to 3,000 linear feet of storm lines a day.

"This new approach to viewing pipes is a paradigm shift for us," Fuller says. "We've been able to modify some of the same equipment we've been using in the past to handle the new technology. Now, we can inspect the pipe without having to clean it first and



**PROFILE:**  
City of Tacoma  
(Wash.) Public Works

**FOUNDED:**  
1884

**POPULATION:**  
200,000

**AREA SERVED:**  
50 square miles

**INFRASTRUCTURE:**  
578 miles of pipe, 200 miles of ditches, 11,096 manholes, 18,000 storm drains, 22,530 catch basins, 660 outfalls, 4 pump stations, 24 holding basins

**EMPLOYEES:**  
Public Works 803, Surface Water Management 88

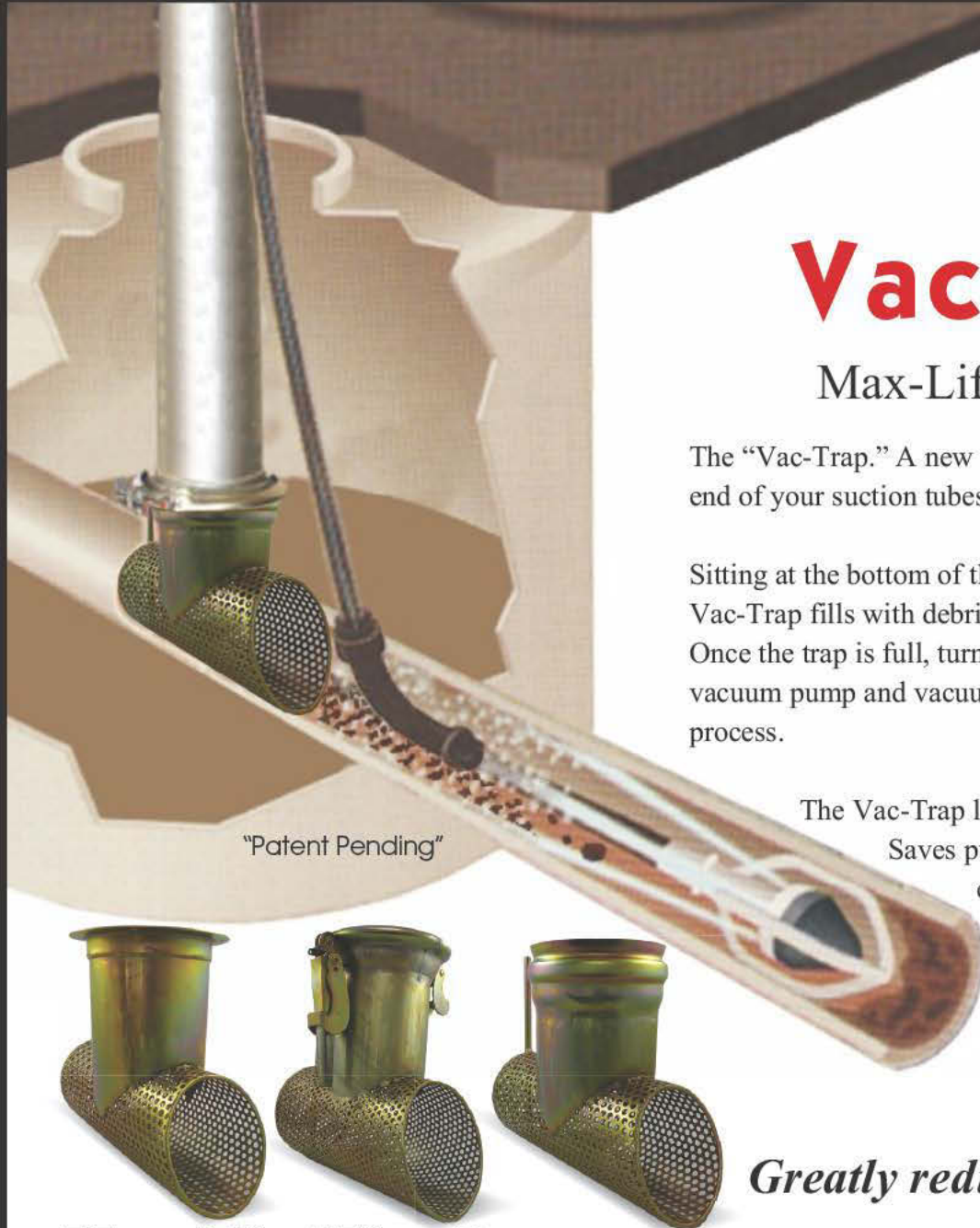
**ANNUAL BUDGET:**  
\$23.1 million  
(surface water management)

**WEBSITE:**  
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The Public Works team includes, from left, crew member Ryan Welander, chemist Rick Fuller, and crew member Troy Ihlen.

with minimal disturbance of any sediment in the pipe.

“It gives us a highly efficient and cost-effective way to get our eyes on the pipes. As a result, we’re no longer just reacting to an emergency and inspecting a pipe only when there’s a problem. Now, because of the economics, we can take a proactive approach and identify and fix areas that need attention before there’s a problem.”

### Tracking contaminant levels

This isn’t the first time Public Works has taken steps to prevent rather than react to a stormwater management problem. For example, a multiyear project to clean up a contaminated channel that empties into Commencement Bay, the Foss Workplan (see sidebar), set the stage for continuing action to sustain the environmental improvements achieved by the project.

“The Foss Workplan started us down the path of extensive monitoring and responding to the results we found in addressing the quality of stormwater discharged into the waterway,” says Lorna Mauren, assistant division manager for the Stormwater Management Utility.

Her staff has expanded a program, begun a decade ago, to gather and analyze data about the sources and levels of contaminants in runoff and condition of the infrastructure. For example, water collected in storm drains



A plaque commemorates the cleanup of the Thea Foss Waterway.

and outfalls before and during rains is tested for contaminants and sediments. The information is used to improve control of point and nonpoint pollution sources and in retrofitting the pipes, catch basins, and stormwater ponds to better manage flows.

Meanwhile, the surface water section continues to monitor the waterway by testing chemical levels, conducting underwater surveys of channel conditions, and ensuring that habitat mitigation sites are working as they should.

“Not many jurisdictions have the kind of water-quality monitoring data and the ability to use this information in guiding efforts on the ground to improve water quality as we do,” Mauren says. “Over the past 10 years, we’ve seen some amazing results, including a 50 percent reduction in solids and an 80 percent reduction in polyaromatic hydrocarbons (PAH) in stormwater flowing into Commencement Bay.

The Thea Foss Waterway and Mount Rainer.



## AWARD-WINNING WORK

Tacoma’s Stormwater Rapid Assessment Program (STRAP) illustrates the city’s commitment to protecting water quality, notes Lorna Mauren, assistant division manager for the Stormwater Management Utility. These efforts include leadership in creating a 10-year water-quality improvement program known as the Foss Workplan.

This plan combines monitoring, source control, maintenance and treatment to improve stormwater quality and prevent recontamination of a U.S. EPA Superfund Site. This work was recognized by the National Association of Clean Water Agencies when it presented the city its 2011 Operations and Environmental Performance Award.

That \$105 million environmental cleanup project, completed in 2006, focused on the Thea Foss Waterway, part of a 10- to 12-square-mile area that makes up the Commencement Bay Superfund Site and one of several waterways that empty into the bay.

The Foss receives untreated stormwater that drains from more than 6,000 acres of industrial, commercial and residential areas. Over the years it had become contaminated with a wide range of pollutants, from phthalates, petroleum-based products and polychlorinated biphenyls to phenols, metals and pesticides.

During a four-year period starting in 2002, about 425,000 cubic yards of contaminated sediment was dredged from the waterway and placed behind a containment berm. Other areas of the waterway were capped with clean sediments to contain some of the contamination. Elsewhere, marine habitats were restored at four locations and, where possible, shorelines were made habitat-friendly. The city cleaned up 80 percent of the Foss and two private companies — Puget Sound Energy and PacifiCorp — cleaned up the rest.

(continued)

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“Our staff is very serious about preventing recontamination of the Foss waterway,” says Mauren. “They’re energetic, creative and excited about what they’re doing and the improvements we’re seeing in water quality. We have a lot of ideas.”

### Spending money wisely

One idea the surface water section has acted on is its asset management program. Designed to help staff prioritize capital improvement projects, it divides the city’s storm system into 65 asset areas. Each is being evaluated on three critical aspects of stormwater management:

- Capacity to handle runoff effectively and prevent flooding
- Quality of stormwater runoff
- Condition of assets

The third factor is where Fuller’s team, STRAP and the Kleen-Vue pipe inspection technology come together. The surface water section is using the information collected by the pipe-scanning cameras to set maintenance and construction priorities. “We’re looking for where we should be spending our money to get the most bang

for the buck,” adds Mauren. Engineers are using the Kleen-Vue system images to rate condition of the storm lines in terms of:

- Red (pipe has failed or needs immediate repair)
- Yellow (pipe has a root intrusion or other problem)
- Green (pipe is good)

“No one has viewed these pipes, some of which were installed 100 to 120 years ago, since they were first put in,” Fuller says. “We can’t afford to replace all 3.3 million linear feet of pipe. Sometimes that old pipe is working just fine, while lines no more than 30 years old may be failing. With this technology, we can find those parts of the system that are in the worst shape relatively quickly and fix them.”

To date, about 70 percent of the pipe inspected has been rated Green. “Some of the 100-year-old pipe is in great shape,” Fuller says.

### System operation

Distributed in the U.S. by KEG Technologies, the Kleen-Vue system allows an operator to inspect a line and watch and record the process as it happens. Images from the two digital cameras are transmitted wirelessly as far as 980 feet to a receiver placed above a manhole.



The Kleen-Vue wireless camera and cleaning unit from KEG Technologies is shown in a manhole about to inspect a segment of pipe.

From there, the images are sent to a monitor where the operator can view the pipe and use a keyboard to enter any additional information about the pipe’s condition. The images and any operator input are stored on an MP4 file. The city’s proprietary geospatial software is used to identify the locations of the images. The information can then be accessed online at various remote sites for analysis.

The Kleen-Vue system’s stainless steel sled is connected to a 1-inch high-pressure hose. Water flowing through eight jets propels the sled forward as it slides across

any sediment in the pipe. “In some places, we’ve had to clean the pipe before we can send the Kleen-Vue unit through, but more than 90 percent of the time we don’t need to,” Fuller says.

“Also, because we’re using such low pressure and a small amount of water to operate the unit, any historical sediment in the pipe that we disturb travels only a short distance. That’s very important with our environmentally sensitive receiving waters.”

Public Works has worked with Sahlberg Equipment Company, a supplier of infrastructure mainte-

Crew members Ryan Welander, left, and Troy Ihlen with the truck/trailer jetter from O’Brien Mfg. (A Div. of Hi-Vac Corp.) and Kleen-Vue system from KEG Technologies. The Center for Urban Waters and the Thea Foss Waterway are in the background.





Ryan Welander, left, and Troy Ihlen pull the Kleen-Vue system back to the trailer with the hose reel. Ihlen continues to inspect the pipe on the way back to the trailer.

**WATCH THEM IN ACTION**  
 To learn more about the City of Tacoma (Wash.) Public Works, view the video at [www.mswmag.com](http://www.mswmag.com).

nance and construction equipment, to acquire the Kleen-Vue system and adapt it to local needs. They have mounted the monitor/keyboard, the hose reel, the pump and a 700-gallon water tank on a trailer. The water tank can be filled using a hydrant or a water truck. At the 80 gpm flow used with the Tacoma unit, one tank of water provides eight to nine minutes of actual jetting time for operating the camera and sled.

**Attractive economics**

Fuller reports that his crew can inspect as much as 600 feet of pipe in eight minutes before reaching the end of the water hose. In the first six months of using this equipment, his crew inspected more than 200,000 linear feet of pipe.

Now that they've worked out all the kinks in operating and adjusting to the Kleen-Vue system, Fuller expects his crew to be able

to inspect about 600,000 linear feet of pipe a year. The Kleen-Vue system and trailer setup cost about \$200,000. Amortizing that expense over the life of the unit and including overhead, the cost of viewing the pipe is about 50 cents per foot.

"That low cost is the big ticket," Fuller says. "In terms of asset management, this new system paid for itself in six months. That's why we can be very proactive in our storm line maintenance program." ♦

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# DEEP INTEGRATION

The City of Arlington creates a sophisticated database combining GIS data with line condition assessments, producing major efficiencies

By Peter Kenter



Utility technician Marcus Phillips, left, and crew chief Alex Holmes clean a sewer line — an essential daily task in an extremely organized system maintenance and rehabilitation program. (Photography by Glen Ellman)

**T**he Arlington (Texas) Water Utilities Department has always been an early adopter of technology. In the mid-1990s, the department launched a project to electronically catalog the entire sanitary sewer and water system.

But what began as a simple mapping project has blossomed into a system that combines explicit descriptions of department assets with geographic information system (GIS) coordinates. The result is a database that can produce a computerized ranking for any length of pipe and provide impartial



**PROFILE:**  
Arlington Water Utilities, City of Arlington, Texas

- FOUNDED:** 1894
- POPULATION:** 367,000 (100,000 accounts)
- AREA SERVED:** 99.7 square miles
- EMPLOYEES:** 222
- INFRASTRUCTURE:** 1,400 miles of water mains, 1,200 miles of sewer mains
- ANNUAL BUDGET:** \$116 million
- WEBSITE:** [www.arlingtontx.gov/water](http://www.arlingtontx.gov/water)





**Arlington Water Utilities employees take pride in using technology and people power to keep their system operating reliably and efficiently.**

guidance on which assets most immediately need repair or rehabilitation.

The department has achieved greater efficiency, not only by allocating its resources to the projects that need the greatest attention, but also by integrating all construction and repairs of road-building projects.

### Sound leadership

Julia Hunt, P.E., director of Water Utilities, has contributed to the project since its inception. She began working with the city as a co-op education student in 1981 while studying civil engineering at Texas A&M University. One of her early assignments when she joined the department full time in 1985 as a graduate engineer was to buy its first desktop computer.

"It was an IBM XT with a math co-processor so that we could run a hydraulic engineering program," says Hunt. "I stayed closely involved with computer applications, so when a new position as GIS manager opened up in the water department in 1996, I applied and was selected for the job."

At the time, the city, between Dallas and Fort Worth, was hand-

tracing and uniquely identifying tax parcel information, then digitizing it. The process involved using a mouse-like "puck" to trace the outlines of the parcels on paper maps. It was the first step in creating a virtual representation of the city's infrastructure.

### Retaining staff knowledge

"We realized that department personnel had a lot of expertise with waterlines, sanitary sewers, manholes and other utilities, but that these people would soon be retiring along with their knowledge," says Hunt. "It's an issue that every utility struggles with. That realization led to the recognition that we needed to relate the information to the parcels we had already recorded on the mainframe and city's early GIS."

Information services manager Bob Lemus has worked in GIS since the early 1990s and became the city's GIS applications supervisor in 1999. The current GIS uses Esri ArcMap 10 software. "I'll give Julia credit," says Lemus. "By the time I had arrived, the main work was done converting the paper map data into electronic GIS."

"Just as important, however,

**"We realized that department personnel had a lot of expertise with waterlines, sanitary sewers, manholes and other utilities, but that these people would soon be retiring along with their knowledge."**

Julia Hunt, P.E.



Julia Hunt

## APWA AWARD

This year, Julia Hunt, director of Water Utilities for the City of Arlington, accepted a Top Ten Public Works Leader of the Year award presented by the American Public Works Association (APWA). The award is a national honor for meeting the highest standards of professional conduct in the field.

Hunt was nominated by Ronnie Bates, president of the Texas Chapter of the APWA, in light of her record of accomplishments and exemplary career in public works. In a supporting letter, Arlington mayor Robert Cluck wrote: "Julia has consistently demonstrated superb engineering talent and visionary leadership skills that have allowed her to bring value to the organization."

was the GIS implementation plan. Years ago, people were transferring map images and spatial information to AutoCAD. The system chosen here features a relational database, allowing information to be easily interconnected. We're now reaping the benefits from a design plan initiated years ago."

Getting buy-in from department workers was a major consideration. Some field crew members were concerned that because the original paper maps used to record parcel data were not 100 percent accurate, the database would reflect those inaccuracies.

"We had to make those people part of the process," says Hunt. "We gave them access to an interface to the maps and database and told them that if they found anything wrong, we would correct it within 14 days. That process continues today. Department field workers form the first line of defense against inaccuracies."

Proposed changes or additions to the original database can be submitted by department staff, creating temporary edits that are confirmed by the GIS department.

All new sewer and water construction is verified by one mem-

Construction crew workers Jose Ortiz (on backhoe), Pedro Sanchez (second from right) and Armando Rodriguez help restore a roadway after a water main replacement.

ber of a dedicated team of three GIS technicians who check valves, lines, fire hydrants and cleanouts, observing reality as compared to the virtual reality of the database.

### Input simplified

“The information must be entered from a standard list of attributes and numbers to ensure that it is accurate,” says Lemus. “We place restraints on the database to remove values that could not possibly be right. For example, if you’re identifying waterline material, you have to choose from PVC, ductile iron and cast iron — you couldn’t indicate it was made of wood.”

Later, a GIS technician who was not involved in the assessment provides a quality assurance check as standard operating procedure. Spot checks by supervisors provide an additional layer of quality assurance.

A change in the way roadwork projects were allocated in 2002 led to the development of a new repair protocol for the water department. The city instituted a quarter-cent sales tax and dedicated the proceeds to the Public Works and Transportation department, specifically for roadway maintenance.

“Because of that funding, road construction suddenly became more aggressive,” says Lemus. “We were seeing sanitary sewer and water projects completed, and then a few months later Public Works would put the same stretch on its project list. Sometimes it was the other way around, with a water project cutting into a brand-new street and putting a zipper patch onto it.”

Public Works had developed a system for determining road conditions mapped out by a van carrying sophisticated surface monitoring equipment. The city’s entire road surface is monitored every three years, and the information is translated into a scoring system to determine which road segments require the greatest attention.

### Objective assessment

A proposed new system, dubbed



Renewal, Rehabilitation and Prioritization (RRP) would score candidate water or sanitary sewer line projects in an objective fashion compatible with the road construction scoring system. The two-pronged program aimed to standardize the methods used to set priorities for repair and rehabilitation of department assets and to consolidate that information at a central location.

“The biggest challenge was getting everyone on the team, from field staff to managers, to understand why it was important to capture the best information our field leaders were giving us, so we could develop a scoring system to prioritize those decisions,” says Hunt. “This would give us a defensible position for our repair and rehabilitation schedule. A customer may point to a water main that broke twice last year, but we could show them why other projects were scheduled in front of it.”

The prioritizing system was based on factors that included work order history, pipe material, pipe age, pipe capacity, soil conditions, customer service calls, cost of service, and criticality of the infrastructure. The result was a rating system that scored water



Utility information services manager Bob Lemus and his team have an important role in taking care of the city’s GIS, which includes Esri ArcMap 10 software.

and sanitary sewer lines from 0 to 100 — the higher the number, the greater the need for attention.

“We also interviewed staff to try to quantify the gut feelings people had about what lines needed to be renewed and rehabilitated,” says Lemus. “After the application was developed we did a lot of ground truthing, checking the scores against reality, until everyone felt comfortable.

“Julia passed some of the first reports to management staff to see if the scores made sense. Even when scores seemed to deviate a little too high or a little too low, when they looked at the line segments, the score was more accurate than their gut feelings.”

### Cooperating with construction

Later that year, the two depart-

ments formed a roadway, water and drainage committee, designed to coordinate all construction projects and take advantage of any scheduled work. However, no additional funding was made available on the sanitary sewer and water side — repair and rehabilitation budgets still relied on water and wastewater rate revenue.

“We meet with Public Works once a month or as needed, and we rely heavily on that rating system and the GIS maps,” says Brad Franklin, P.E., manager of water engineering. “The scoring system is cross-referenced with the roadway repair schedule, which occasionally influences the priority of a particular length of sewer or water main.”

Water Utilities has increased its cleaning of the sanitary sewer system, with a goal of cleaning all 6- to 15-inch sanitary sewer lines at least once every three years. The problematic lines are also CCTV inspected to determine the best course of action.

Inspection information is collected in a database using Granite XP data collection and management software from CUES. On reviewing the video, that information is translated into a digital rating using Pipeline Assessment and Certification Program standards supplied by the National Association of Sewer Service Companies (NASSCO). The information is then weighted and incorporated into the RRP score.

**“If we’re looking for an answer, we don’t pass the buck to someone else. We don’t make excuses. We do our best to provide the type of service we believe our citizens expect.”**

Julia Hunt, P.E.

“You can give this observed rating a higher weight in the total RRP rating if advisable,” says Lemus. “For example, if the line is cracked, there’s not much more to be said about it — it’s very important. A break at a busy roadway scores even higher.”

### Database maturing

The water department database is mature, offering sewer and water main attributes as requested. Users can view simple maps or drill down into GIS or other map data. A data snapshot captured in summer of 2011, for example, shows that the city has 1,400 miles of public waterlines, about 38 percent PVC, 43 percent asbestos cement, 6 percent cast iron, 6 percent prestressed concrete, and 7 percent of other materials.

About 1,200 miles of public sanitary sewer lines are 66 percent PVC, 29 percent vitreous clay pipe, and 5 percent other materials. The largest part of the infrastructure dates back to a building boom that occurred in the 1970s and early 1980s.

The city took advantage of the database by accessing water flow modeling information when the Dallas Cowboys constructed Cowboys Stadium in 2009, a short distance from Rangers Ballpark, home of the Texas Rangers.

“We called some cities with similar stadiums to determine water needs and wastewater flows,” says Hunt. “We were able to determine from our computer models that most of the planned water and sanitary sewer lines were already large enough and

that the network of waterlines would almost fully supply the stadium’s needs. We needed only to upsize one section of water supply line.”

### Planning big projects

Each year, the department produces a report on the entire system. Individual pipe lengths are coordinated with the condition of roadways. The roadway, water and drainage committee considers entire subdivisions when selecting the combined projects, and those requiring the most attention are color-coded. Larger subdivision projects are planned two to three years in advance and coordinated with Public Works street rehabilitation plans.

“We’d rather take advantage of road-building funds to repair pavement than use water revenue zipper patching on these projects,” says Franklin. “Water Engineering looks at the RRP scores and tries to combine the greatest number of repairs and rehabs with the highest scores

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Utility technician Aaron Hillard tamps the soil with a Multiquip tamper after connecting a new service line.

into the smallest number of GIS coordinates or geographic area. Once we create the project list, our field operations managers visit the actual streets and determine if they agree with the priority."

The most common source of waterline damage is the area's highly elastic clay-rich soil. Known as "black gumbo," the soil expands and contracts significantly with alternating dry spells and rainfall, eventually crushing lines as it shifts. On the sanitary sewer side, root infiltration is the worst culprit.

While in-house operations crews repair line breaks and leaks and deal with other short-term emergencies, most of the new construction and rehab work is completed by outside contractors. Five on-staff engineers act as project managers, designing tender packages and offering work to the lowest qualified bidder.

### Planned replacement

While the most cost-effective repair method in the area is dig-and-replace, the department has specified technologies that include cured-in-place pipe lining, direc-

tional drilling, and pipe bursting. Sanitary sewer and waterlines are most often replaced by PVC, although larger water mains are replaced with ductile iron.

The department aims to replace 2 percent of its water infrastructure each year, although funding sometimes dictates settling for a lower percentage. The department maintains an ongoing gap analysis that quantifies the expected average lifespan of water infrastructure. The goal is to keep the gap from growing and ultimately to decrease the gap as the system is rejuvenated.

The continuous rehab program has paid off. By progressively investing in the most compromised water infrastructure, the city has achieved a performance measure of just 2.7 breaks per 100 miles of water main annually during normal weather conditions.

The GIS and associated databases continue to evolve on the macro and micro levels. The department is developing a master plan for Lake Arlington that includes computer modeling of the effects of potential development and other factors. On the other end, the city has launched a program to check each water valve by manually exercising it and recording its condition.

While data technology may appear to be the star of the Arlington Water Department, Hunt credits its human team with the department's success. "We spend a lot of effort to make sure there are no walls within our organization," she says. "If we're looking for an answer, we don't pass the buck to someone else. We don't make excuses. We do our best to provide the type of service we believe our citizens expect." ♦

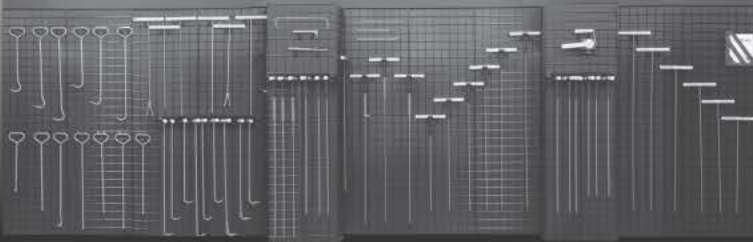


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A composite manhole replaces a manhole approaching failure in a lightly used turn lane. (Photos courtesy of Gwinnett County Public Utilities)

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# CONQUERING CORROSION

Steel-reinforced polymer concrete manholes enable a Georgia utility to overcome the ravages of hydrogen sulfide

By *Scottie Dayton*

**“The structures cost more than others, but after factoring in the excavation, manpower, and materials, the results we’ve seen since the initial install have justified the purchases. And composite manholes are maintenance free.”**

**Howard Buck**

A service call to unblock an 8-inch gravity main fed by a 6-inch force main packed a surprise for the Gwinnett County (Ga.) Public Utilities crew. When they popped the cover on the dump manhole, they found the four-year-old epoxy-coated concrete structure disintegrating.

The city requires dump manholes to be lined with epoxy, but contractors choose the product.

Howard Buck, sewer collections manager, sent two workers to inspect the 197 dump manholes on 280 miles of force mains. They found that lined and unlined structures alike were corroding. “Hydrogen sulfide was eating through the lining as if it wasn’t even there,” he says.

Buck attended the 2008 American Water Works Association show looking for solutions and met Eric H. Davidson, P.E., vice president of U.S. Composite Pipe. Davidson

shipped a steel-reinforced polymer concrete manhole as a pilot project. Installed that October, the manhole still looks like it did the day it arrived.

**Prime suspects**

The county’s 2,850-mile gravity sewer system has 231 pump stations and more than 70,000 manholes. Only those on the force mains were involved; five were approaching imminent failure. To educate



**Gwinnett County workers prepare to install the sections of a composite manhole.**

the finance department, Buck photographed the composite manhole and those in jeopardy.

“That gave me the justification I needed and they authorized the purchase,” says Buck. “We were fortunate that four of the manholes were in easements or on the shoulder and one was in a lightly used turn lane. Had they been in the road, a couple would have failed from the weight of traffic.”

The polymer concrete used in composite manholes contains selected blends of aggregates and fillers held together with a high-strength, corrosion-resistant, thermosetting resin. Polymer concrete is its own protection from corrosion and can be used in pH 1 to 13 environments. The steel reinforcement handles severe live load and backfill dead loads.

A dedicated inspection crew used one of four new CCTV vans with CUES Inspector General portable mini mainline systems to identify severely deteriorated manholes and monitor those with less corrosion. They found six more ready to fail. “The usual turnaround time from the factory is two weeks, but Eric shipped the first order in one,” says Buck. “I ordered six more manholes in July and replaced 20 more by October.” The oldest lined structure was installed in 2001 and the newest in 2006.



**LEFT: Hydrogen sulfide ate through an epoxy lining and attacked the concrete manhole. RIGHT: Hydrogen sulfide corrosion in a 6-inch force main. A worker's shovel went straight through the main during excavation.**

are down,” says Buck. “The team also is very good at what they do, and they hustle like worker ants. They haven’t hit a manhole that they couldn’t replace in eight hours.”

A call to the lift station shuts off the pumps, and the workers then cut the incoming and outgoing pipes, remove the manhole, and set the monolithic composite base slab, which prevents cold joint leaks. They then reattach the pipes so the station can pump if need be.

Manhole sections seal with an offset rubber gasket joint. When the structure reaches the top, the team installs the original ring and cover, calls the station to turn on



### Professionals at work

Buck coordinates with pump station personnel to determine hold time, as some manholes have two to four force mains. A dedicated three- or four-member crew replaces a structure in one workday.

Depending on the manhole’s depth, the team uses rubber-tired backhoes or trackhoe excavators to dig around the existing structure and expose the concrete-lined ductile-iron pipes. If they find corrosion, they strip back until they hit solid material, then replace the bad section with PVC pipe.

Meanwhile, a lift station mechanic pumps down the wet well and drains back the force main. A two-member crew with a Vactor 2100 combination truck remains at the lift station in case it should begin to fill.

“By the time the guys set up, it’s 9 or 10 in the morning and flows

the pumps, and backfills if there are no leaks.

“So far, the hydrogen sulfide hasn’t reached our rings and covers,” says Buck. “It’s usually the bottom section and maybe the next one up, depending upon where the force main enters. If it comes in three or four feet high, sewage

splashes against the opposite wall as it shoots out. If it’s a shallow manhole, corrosion reaches the top cone section and stops. We don’t know why.”

### Field trip

Buck saves everything pulled from the ground in the county yard, then escorts Finance and Engineering personnel to view the collection. “Pictures are great, but seeing the epoxy lining hanging off the walls makes an even greater impression,” he says. “It’s one thing to say that the metal on some failed mains is paper thin. It drives home the point when I rip off a chunk with my bare hands.”

Another call to relieve a blocked manhole held more surprises. After clearing the obstruction, the cleaning crew jetted the line using a Vactor truck. When unfamiliar material washed down, they called the inspection crew. The camera revealed that the pipe’s concrete lining was falling off, creating the backup.

“They inspected 1,400 feet and found the dump manhole and next three downstream structures badly corroded,” says Buck. “My 2012 budget includes 20 to 30 composite manholes. Once we install them, replacements should taper off to one or two per year. The structures cost more than others, but after factoring in the excavation, manpower, and materials, the results we’ve seen since the initial install have justified the purchases. And composite manholes are maintenance free.” ♦



# Indy 2012

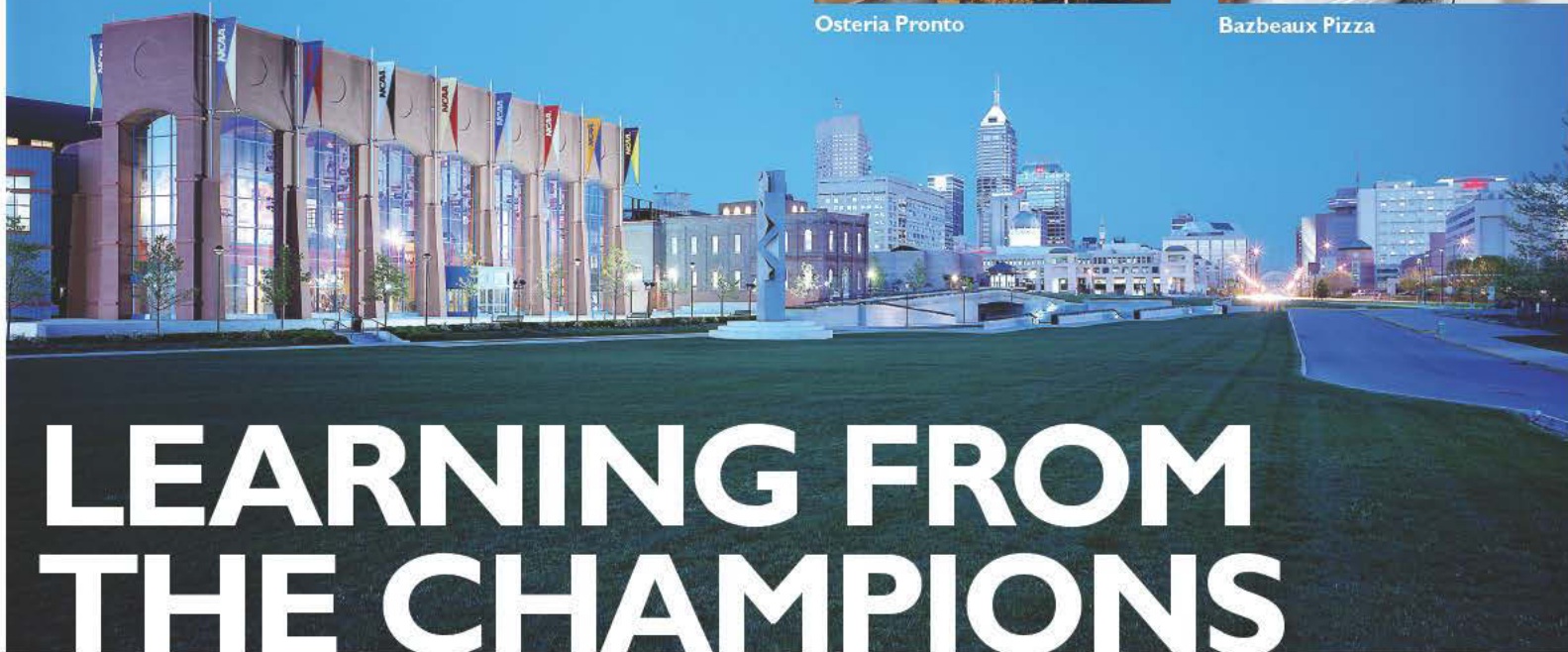
White River State Park offers an array of attractions, including the NCAA Hall of Champions (foreground).



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# LEARNING FROM THE CHAMPIONS

NCAA exhibition presents the history of college athletic competitions along with a variety of hands-on experiences for fans

By Ted J. Rulseh

The 32nd annual Pumper & Cleaner Environmental Expo International, the biggest annual trade show for the environmental services industry, is moving to Indianapolis in 2012, a city that has much to offer to visitors.

You can learn a great deal about how to win in business from the champions in the world of college sports. The NCAA Hall of Champions in Indianapolis shares the experience of top college athletes in some 23 events.

Located just four blocks from the Convention Center at 700 W. Washington St., the Hall of Champions has 25,000 square feet of exhibits, including a display of a 1930s-era gymnasium.

In theater video presentations, young champions share their expe-

riences and thoughts on life as student-athletes. A March Madness theater provides an intimate look inside the men's and women's NCAA basketball tournaments.

The Hall also gives you first-hand athletic experiences, with activities like a downhill skiing simulator and video games in which you throw real balls at moving targets. Visit [www.ncaahallofchampions.com](http://www.ncaahallofchampions.com).

## Shopping

The Fashion Mall at Keystone is an upscale shopping center offering 95 specialty shops and restaurants. Just 20 minutes from the Convention Center at 8702 Keystone Crossing, its high-end anchors including Saks Fifth Avenue and Nordstrom. With a host of luxury and specialty retailers, it attracts

discriminating shoppers from all over the Midwest. Visit [www.simon.com/mall/default.aspx?ID=166](http://www.simon.com/mall/default.aspx?ID=166).

## Fine dining

Osteria Pronto takes you straight to the heart of Italy. Just a block from the Convention Center at 10 S. West St., this bistro-style restaurant serves dishes inspired by authentic regional Italian cuisine in an inviting environment with fresh fare made from fine locally sourced ingredients. Located inside the new JW Marriott hotel, it offers menus full of Mediterranean flavors at lunch or dinner, along with a carefully chosen wine list. Dinner entree prices range from \$11 to \$34. Visit [www.osteriapronto.com](http://www.osteriapronto.com).

## Casual dining

Since 1986, Bazbeaux Pizza has

been an Indianapolis favorite. One of three locations is downtown at 333 Massachusetts Ave., two minutes from the Convention Center. Bazbeaux is a multiyear winner of the *Indianapolis Monthly* magazine People's Choice Award for pizza. It offers innovative pizzas with fresh ingredients and a choice of 52 toppings.

All pizzas are made with a blend of provolone, mozzarella and Pecorino romano cheeses and homemade dough and tomato sauce. You can choose wheat or white crust, thin or thick. Toppings, besides the basics, include Andouille sausage, Mexican sausage, barbecue or Cajun chicken, albacore tuna, crab, shrimp, snow pea pods, roasted red peppers, sun-dried tomatoes, and black bean dip. Salads and sand-



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Children's Museum of Indianapolis

wiches are also available. Visit [www.bazbeaux.com](http://www.bazbeaux.com).

**Arts/Entertainment**

To give the kids a thrill during Expo days, it's worth a 10-minute drive to the **Children's Museum of Indianapolis**, at 3000 N. Meridian St. Billed as the world's largest children's museum, this five-story playground is built for kids of all ages, with nearly 500,000 square

feet, more than 120,000 artifacts, 12 permanent exhibits, and many temporary exhibits. Some 1.3 million people visited last year.

Highlights include roaring dinosaurs, science experiments, an antique carousel, and the five-story Fireworks of Glass. The museum aims to create learning experiences with engaging exhibits and interpretive activities. Visit [www.childrensmuseum.org](http://www.childrensmuseum.org). ♦

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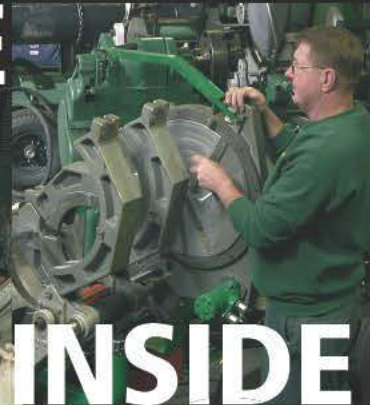
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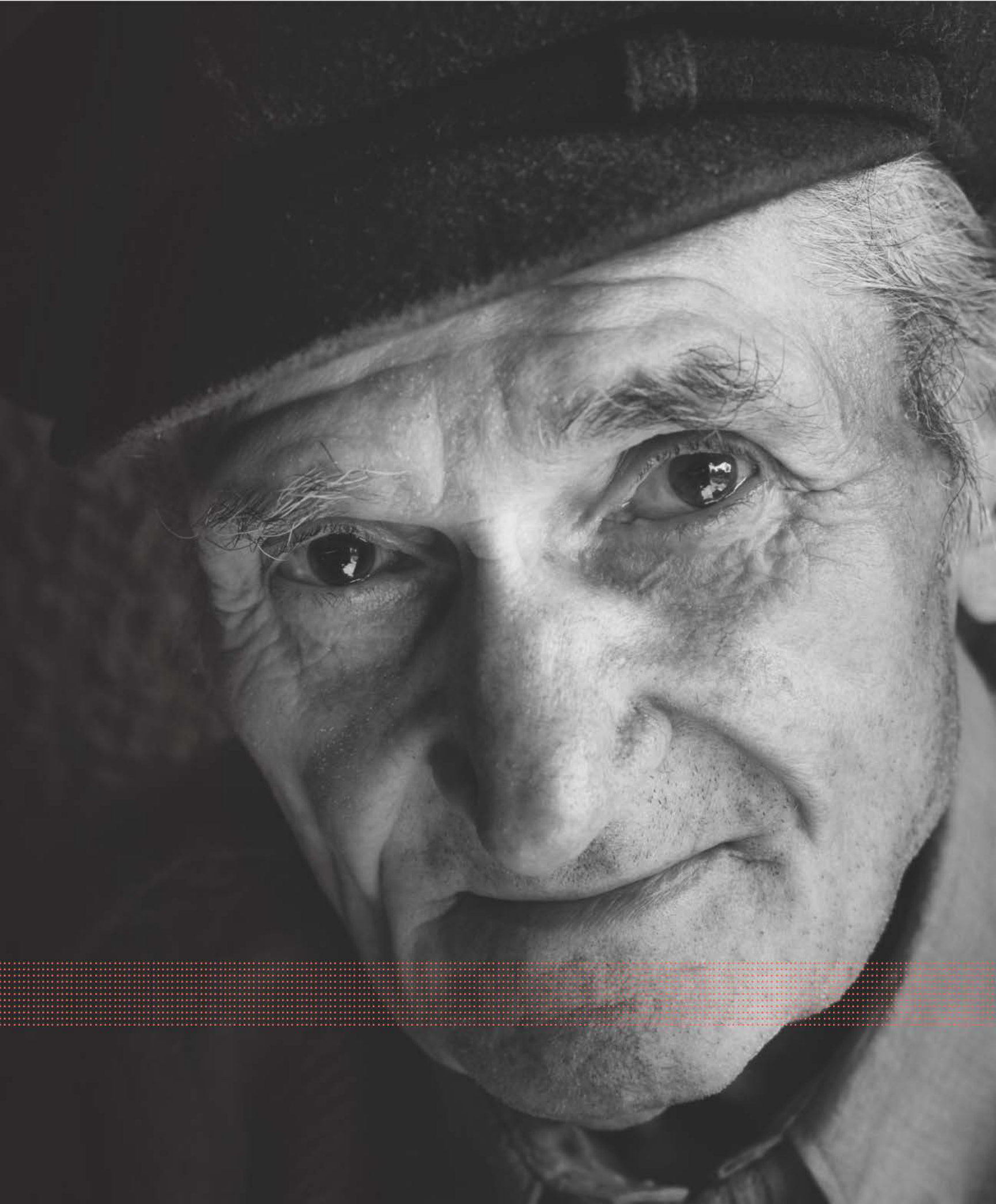
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Have you found a way to make your work life easier or more efficient? *Municipal Sewer & Water* would like to share your ideas through this occasional column. Email your Brainstorms ideas to [editor@mswmag.com](mailto:editor@mswmag.com).

# TRIAL BY FIRE (TRUCK)

By Peter Kenter

A road maintenance crew in northern Ontario has found that a stream of well-aimed high-pressure water from a fire department pumper may be as effective as using a combination truck in some cases.

A vicious rainstorm in June 2008 left a corrugated steel culvert on Highway 590 near Thunder Bay three-quarters full of sand, rocks and gravel. Standard operating procedure involves clearing culverts using a combination truck.

**Never a doubt**

"We've contracted vacuum trucks for culvert clearing, sewer sump and storm drain work, but it's slow and limited to the size of debris it can move," says Adrian Tessier, a maintenance superintendent with the Ontario Ministry of Transportation (MTO). "The culvert was four feet in diameter and 65 feet long. We did the math and it would cost more to contract a hydrovac than to replace the culvert."

Tessier, a volunteer firefighter, reckoned the situation could use a blast of high-pressure water from a firehose. "I've seen firehoses knock down a brick wall," he says. "I had no doubt it would work."

A few weeks later, an MTO maintenance contractor used a backhoe to dig a hole on one side of the pipe to catch the gravel. The backhoe would stand by to excavate the debris as it exited the pipe.

MTO hired a pumper truck from the township of O'Connor Fire Department to conduct the experiment. Because the fire truck remained on call during the operation, water was fed to the pumper from a tanker truck containing more than 5,000 gallons. The waterjet was supplied by a 1-inch firehose nozzle attached to a 2.5-inch pressure line.

**Generating interest**

"Volunteer firefighters anchored the hose to the ground and aimed a 150 psi waterjet at the far end of the pipe," says Tessier. "At more than 300 gpm, the backhoe couldn't



PHOTOS COURTESY OF ADRIAN TESSIER

The township of O'Connor Fire Department assisted the Ontario Ministry of Transportation in clearing the culvert with an experimental high-pressure water method using a fire engine.

keep up with the gravel exiting the culvert."

The tanker was refilled once and volunteer firefighters answered a call during the operation, but in less than half an hour of active clearing, the firehose supplied almost 11,000 gallons of water and ejected more than 20 tons of debris.

Tessier points out that the operation could only succeed with a culvert that has 20 percent or more clearance, allowing debris to be ejected through the other end of the pipe.

"You also need to have access to the other side of the culvert to clear out debris, and you need to consider the length of the pipe," he says.

The operation has sparked considerable interest from other jurisdictions. "Adrian is a born innovator," says Dave McColl, manager of operations with MTO. "When we



The culvert became filled with gravel and rocks after a June 2008 rainstorm.



The culvert after high-pressure water cleaning.

need the skills of a McGyver, he's our go-to guy." ♦

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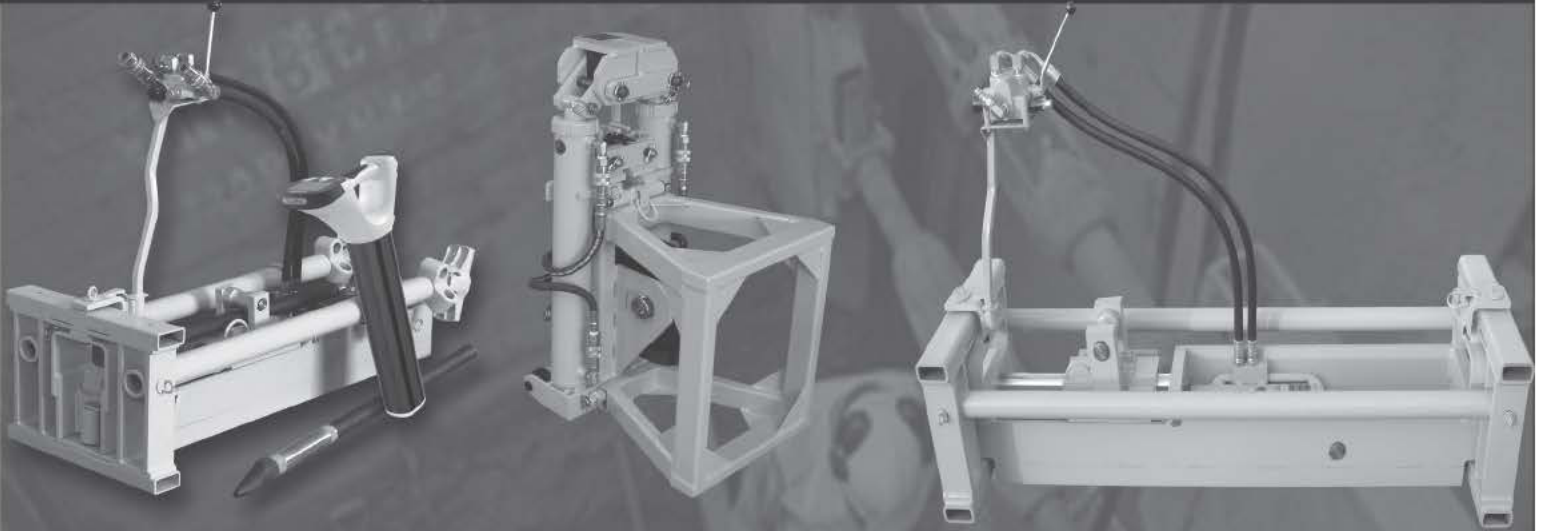
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# TAKING CONTROL

MultiSmart Pump Station Manager and PumpView remote software from MultiTrode give operators high-tech control of pumping systems

By Erik Gunn

Where there's a pump, operators need some means of control and monitoring. Digital technology makes it possible to create smaller yet more sophisticated control systems.

MultiTrode, based in Boca Raton, Fla., has developed the MultiSmart Pump Station Manager, an electronic control system for monitoring and controlling individual pump stations. The company also provides PumpView Web-based software for remote control of a utility's entire system of pump stations.

On Oct. 17, Travis Walker of the Beaver Dam municipal wastewater utility demonstrated the functions of the city's MultiSmart manager installed on one of the city's 13 sewer system lift stations. On Sept.

28, Aaron Parkinson of MultiTrode demonstrated PumpView software using a Web-based simulation. On Oct. 28, he conducted a remote demonstration using a real-life PumpView installation at New Bedford, Conn.

## Walk-around

The MultiSmart Pump Station Manager is encased in a blue-and-silver plastic housing about 7 by 8.5 inches and 6 inches deep. A pump system data display screen takes up about two-thirds of the front. A series of control buttons ring the screen, and a 12-button telephone-style numeric keypad at the upper right corner of the casing is used to program information into the device.

The PumpView software is a Web-based application launched



Travis Walker of the City of Beaver Dam shows the operation of the MultiSmart unit that operates a lift station. (Photography by Matt Gunn)

in an Internet browser. It uses a graphical interface on which operating personnel can observe and control the functions of a municipality's pump system.

## Operation: MultiSmart

The MultiSmart unit demonstrated in Beaver Dam was located outdoors at a sewer system lift station serving part of the southwest area of the city. Rob Minnema, water and wastewater utility foreman, said it was installed about two years ago during an upgrade of the lift station's controls. Thus far it is the only MultiSmart unit in service in the city.

For the demonstration, Walker unlocked a metal housing to show the MultiSmart unit inside. He punched a succession of buttons on the unit to display the various information screens with which it was configured.

The first screen indicated the status of the lift station's two pumps, which were set to AUTO and programmed to operate in alternating sequence. The screen included a label showing which pump was next to run; labels also indicated how long each pump had run last (two minutes in this case). A vertical bar at the left edge of the screen provided a

## TECHNOLOGY TEST DRIVE

**EQUIPMENT:**  
MultiSmart Pump Station Manager and PumpView remote pump system control software

**SUPPLIER:**  
MultiTrode Inc.  
Boca Raton, Fla.  
561/994-8090  
www.multitrode.com

**LOCATION OF DEMO:**  
Beaver Dam, Wis.  
and via Internet

**DEMONSTRATED BY:**  
Travis Walker, Beaver Dam water utility; Aaron Parkinson, MultiTrode

**LIST PRICE:**  
MultiSmart \$3,400 to \$7,000;  
PumpView \$50/month per pump station

**FIGURE 1.** The PumpView opening screen has a button for each pump station. To gain access to a pump station's individual controls, the operator clicks on the appropriate button.



visual indication of the water level in the pump station — about 40 percent at the time of observation.

Additional screens showed a history of the pumps' operation, listing run-time hours, faults, failures to start, and other events. For example, according to Walker, Beaver Dam periodically checks that the two pumps are properly alternating operation. Additionally, the control monitors the volume (in gallons) that each pump moves at a given time. If one is pumping less and the other more, that may indicate that one pump is clogged or otherwise compromised and in need of maintenance.

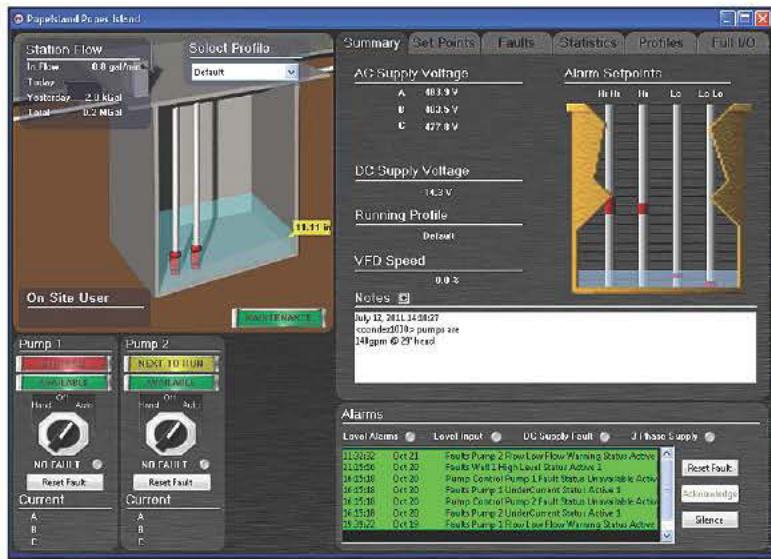


FIGURE 2. After the operator selects the pump station, the screen shows a graphic representing the station and its components and controls.



FIGURE 3. Clicking on the Set Points tab in the upper right of the PumpView interface allows the user to change the set points of the pumps by dragging the appropriate icons (the red or green rectangles on the vertical shafts in the image).



Screen readout on the MultiSmart control when a fault occurs.

"It's all automatic," said Walker. "We stop in once a week to check it." Minnema explained that the device was programmed with the cell phone numbers of several city employees trained to respond to emergencies. In case of an emergency, such as a pump failure, the unit calls the cell phones in sequence until one of the call recipients responds.

Walker noted that the city recently updated the software in its unit, downloading the upgrade from MultiTrode, putting it on a flash drive, then uploading it to the MultiSmart device.

### Operation: PumpView

The PumpView demonstration took place in two parts. To show the functionality of various elements of the software package, Parkinson used a simulated ver-

sion of the application. He then conducted a walk-through via Internet showing an actual installation — the system for New Bedford — without changing the controls so as to avoid disrupting operations at the utility.

PumpView opens with a screen consisting of a series of buttons, each corresponding to a particular pump station (Figure 1). During the New Bedford portion of the demonstration, Parkinson selected one station, Popes Island. In the window that opened (Figure 2), computer drawings of rotary switches toward the lower left served as the pump controls. They were set to AUTO but could be manipulated using the computer mouse to select other settings: OFF or HAND.

"Over the Web interface, we can start and stop pumps by clicking on that toggle switch and run that pump remotely," Parkinson said. "If you click the HAND button on one of those pumps, it will send a signal out to the pump station." When a pump is switched to HAND mode, it runs until it

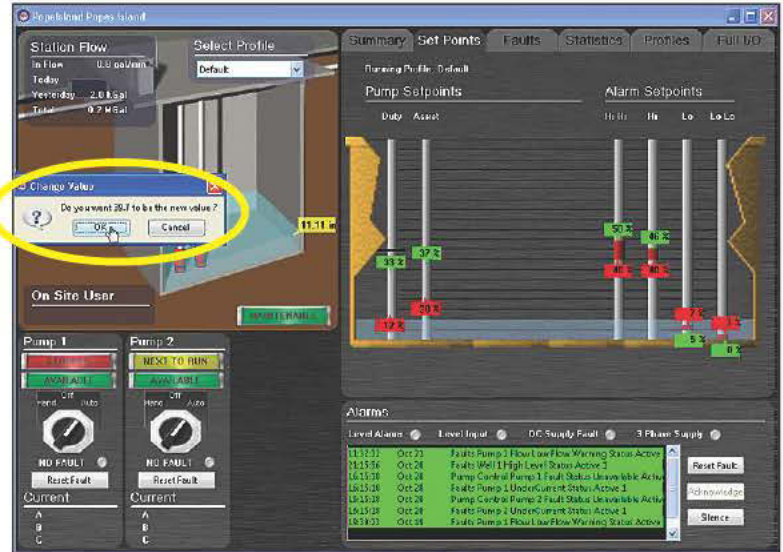


FIGURE 4. A computer mouse can be used to drag the pump set point to a new position on the screen; a dialogue box then asks the user to confirm the change.

reaches its normal off point, then switches back to AUTO.

Immediately below each rotary switch icon was a bar to reset a fault. Just above the control icons was a representation of the pump station. At the upper left corner of the image was a readout indicating the current inflow rate for the pump station as well as the total volume of inflow for the previous day.

"I'd be able to see how many gallons per minute are coming in," Parkinson said. "And then for today and yesterday, I'd have the total

amount of volume that has been pumped through this pump station."

To the right of the image was a series of tabs. The first, Summary, presented data on the AC and DC supply voltage to the system, the current running profile (default), and the variable-frequency drive (VFD) speed.

A second tab, labeled Set Points, showed a series of vertical bars with red icons designating the set points for the pumps in the system (Figures 3 and 4). During the simulation, Parkinson showed how to



**FIGURE 5.** The Faults tab includes a sub-tab for monitoring electrical fault conditions.

use the mouse to change the set points for each pump.

The third tab, labeled Faults, included three subtabs for monitoring general, electrical (Figure 5) and flow (Figure 6) fault condi-

tions. "If you had a problem with a pump, you could zoom in and see what kind of problem you had," Parkinson said.

Additional tabs allow the operator to view statistics for the system



**FIGURE 6.** The Faults tab includes a sub-tab for monitoring flow fault conditions.

and operation profile options. For instance, a pump station could have one profile for dry weather and another for rainy weather, and the system could be used to reset the profile remotely as appropriate.

Regardless which tabs were open, the operator could see below the tab information a recent fault history for the pump station.

### Observer comments

The MultiSmart pump unit was compact and well designed. When installed in an outdoor location, the information screen may be difficult to read on a bright day. Minnema explained that Beaver Dam installed its MultiSmart unit as part of an electrical and control system upgrade for the lift station where it was installed, and that the unit's design made the job easy.

"We didn't have to retrofit anything inside the station itself — just bring the wiring into the new MultiTrode panel," he said. "It's been very reliable." He noted the Beaver Dam unit is fairly simple with just the basic functions and data reports; some more sophisticated data options are available with the unit. At one point, the unit's sensor inside the lift station was regularly building up grease, causing sensor failure. An adjustment to the unit's sensitivity corrected the problem, Minnema said.

**"I'd be able to see how many gallons per minute are coming in. And then for today and yesterday, I'd have the total amount of volume that has been pumped through this pump station, and the total amount of liquid pumped."**

Aaron Parkinson

### Manufacturer comments

Included in the PumpView system is the capability to generate daily reports in the form of Microsoft Excel spreadsheets. The reports include tabs for hours and run starts, flow, power and efficiency, alarms, data on each pump's serial number and specifications, and charts comparing the operation of each pump station in the system. Parkinson generated such a report during the simulation demonstration.

PumpView can be set to a maintenance mode, so that when an employee is at the pump station, alarms created by the maintenance work do not call up other users. "It's not going to create more alarms," Parkinson explained. ♦

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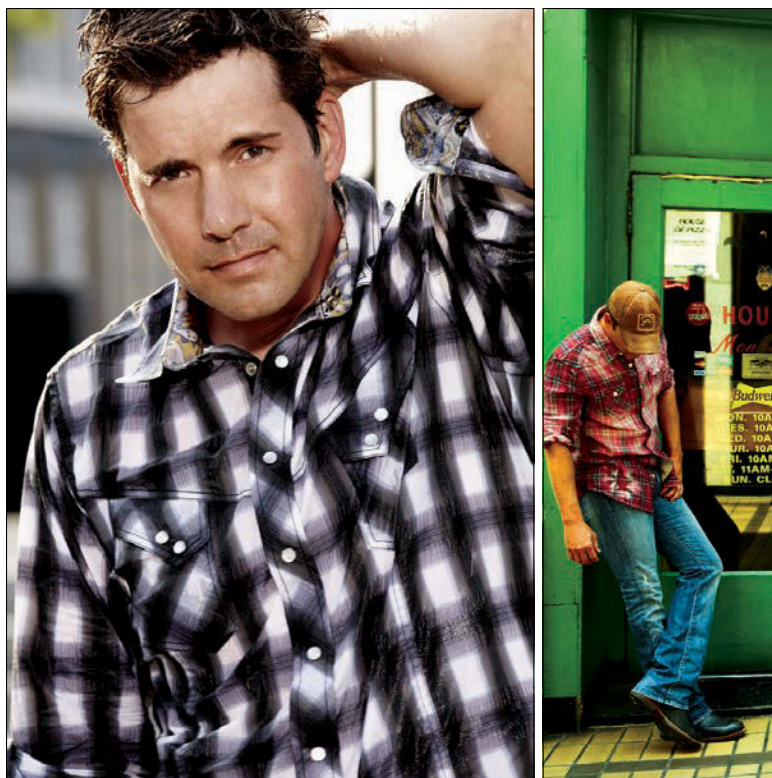


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Country singer Rodney Atkins will perform at the 2012 Pumper & Cleaner Environmental Expo following the ever-popular Industry Appreciation Party.

**“Sometimes you just want to cut loose and have fun,  
and you have to do something unexpected ...**

**You just have to kind of roll with it.**

**That’s how I try to be on stage.”**

**Rodney Atkins**

hum along with Atkins’ many hits, they might not be so familiar with his inspiring personal story.

After being born in Knoxville, Tenn., in March 1969, he was put up for adoption and was twice returned to the Holston Methodist Home for Children by prospective parents who couldn’t deal with his numerous illnesses. Though his ailments worsened, Margaret and Allan Atkins, from Cumberland Gap, Tenn., adopted the boy.

With his dedicated adoptive parents, Atkins thrived and became interested in music during high school. After school, he eventually signed a recording contract, but didn’t release his first album until *Honesty*. The string of hits has never stopped, with the album *If You’re Going Through*

age that helped him find a loving family. In 2011, Atkins headlined the Nashville Give Back Concert to support tornado-ravaged communities through the American Red Cross.

### **A helping hand**

“It is important for us to give to all of those in need. As an artist, I have performed in just about every town that has been hit by the many storms and I feel that this concert is a great way to reach out and help as many people as we can,” he told the Nashville Convention & Visitors Bureau, which helped promote the relief effort. “We wanted to ... call people to action to continue to support the American Red Cross Disaster Relief Fund in any way that they can.”

While Atkins is devoted to

# ROCKIN’ RODNEY

Red-hot country singer and authentic American success story Rodney Atkins will “cut loose and have fun” at the Pumper & Cleaner Expo

*By Jim Kneisz*

Rodney Atkins rose from a hardscrabble beginning as a sickly orphan to the heights of country music stardom, producing back-to-back Billboard top country songs for 2006 and 2007 and continuing to churn out popular anthems of real life and love.

Atkins’ compelling American success story continues with his next musical challenge: Entertaining the throngs at the 2012 Pumper & Cleaner Environmental Expo International. Atkins will bring a bushel basket of heartfelt hits when he arrives on the stage on Tuesday, Feb. 28, at the grand ballroom of the JW Marriott Hotel in Indianapolis.

Atkins’ 7 p.m. performance will follow the ever-popular Industry Appreciation Party — with its festive atmosphere and 25-cent tap beers

— which begins at 5 p.m. The evening of fun caps off the opening day of the Expo exhibits at the adjacent Indiana Convention Center in downtown Indy. The Industry Appreciation Party and Atkins’ live performance are included with full Expo registration.

Atkins is well-known for a string of top 10 hits that started in 2003 with “Honesty (Write Me a List)” from his first album entitled *Honesty*. A familiar voice on country radio for almost a decade, Atkins struck gold in 2006 and 2007, when his singles, “If You’re Going Through Hell (Before the Devil Even Knows)” and “Watching You,” hit No. 1 and were named the top country songs of the year by *Billboard* magazine.

### **Rags to riches**

While country music fans can

Hell gaining platinum status and producing additional No. 1 hits in “These Are My People” and “Cleaning This Gun (Come On In Boy).”

Atkins followed with his third album *It’s America*, with a single of the same title, then “15 Minutes,” and “Chasin’ Girls” heading up the charts. In 2010, Atkins hit with “Farmer’s Daughter,” and he’s currently touring with the lead-off single of his fourth album, the title cut “Take a Back Road,” which hit No. 1 just a few months ago.

While he’s built a solid career in Nashville, Atkins is proud of the family he’s built, including his wife, Tammy Jo, and his son, Elijah. Along the way, he’s found it important to give back to others. He is a spokesperson for the National Council for Adoption and often returns to the orphan-

family and causes he finds important, he hasn’t taken his foot off the accelerator, musically, either. According to his website, Atkins has sold four million singles in the past five years, and the sales have been going viral for “Take a Back Road.” He credits the easy, heartfelt lyrics and laid-back, identifiable message of the song.

“‘Farmer’s Daughter’ was one of the craziest download songs we had. It was peaking at 15,000 to 16,000 a week,” Atkins says. “And now ‘Back Road’ is knocking on 40,000 a week. That was a validation for me to follow my heart ... It’s one of those songs that, the first time I heard it I thought, ‘Boy, that feels good.’ And then it’s catchy and something you want to just crank it up. But then, the more you hear it, you realize it’s not just a ditty; it’s about ... getting right with your soul, coming down to earth.”

“Back Road” is about discovery ... both literally — exploring the beauty found in your back-

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yard countryside, and symbolically — the simple joys of family and life. The emotional tune and the album in general present a winning formula for the thoughtful Atkins.

"I've had some success with my songs, and you've got to sit back and ask yourself, 'Why did these songs connect?' With a lot of songs, the approach is about how perfect things are, or how messed up things are — It's one or the other," he explains. "But for me, real life is there are ups and downs, and if you can, get both sides of that in a song."

And he's taken a reality check when it comes to love songs, too. Atkins says he was never interested in recording conventional love songs until he found several tunes that scratch beneath the surface of complex relationships. He includes several of these on the latest album. And they're songs hardworking family business owners who attend the Pumper & Cleaner Expo can surely relate to.

"Love is not all blue skies and no bills," he says. "It's gutters leak-

ing and the cat messed in the fireplace. It's not convenient at all, and you've got to make time for it — that's the toughest part of it."

### A treat on stage

Love songs, simple slice-of-life songs, or just about anything Atkins performs, he promises an energetic live show. He likes to change up the set list night after night to keep the audience and band in tune and engaged. Expo attendees can expect an edgy and fun time with Atkins and his band.

"Sometimes you just want to cut loose and have fun, and you have to do something unexpected ... You just have to kind of roll with it," Atkins explains. "That's how I try to be on stage, and the shows get better the more spontaneous they are, the less the band knows what's going to happen."

"I'm low-key, but I get excited on stage. I think that if I didn't have that outlet of playing live, I'd be frustrated a lot," he says. "Music was definitely my savior. It's a way of saying things that, hopefully, because it's in the form of music, will stay around awhile." ♦

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# LEADERSHIP AND LITTLE WHITE LIES

Seemingly harmless falsehoods can damage your reputation and lead to bigger issues down the road. Here's why it's important to clean up your act.

By *Dave Anderson*

**P**icture this: It's 4:30 on a Friday afternoon at the end of an exhausting week. You've finally reached a good stopping place in your work and everything seems on track for a clean break when 5 o'clock rolls around. Suddenly, the phone rings. You glance at your caller ID screen and cringe. It's a contractor, the long-winded one who calls "just to chat" and keeps you occupied for hours.

What do you do now? Do you take the call and resign yourself to a late start on the weekend? Or do you have your assistant say you've already left for the day? If you opt for the white lie, you're not alone. We all shade the truth every now and then, and some of us find ourselves doing it so often we barely notice anymore.

But those "harmless" untruths can be anything but. Not only do these fibs reflect on your character — after all, lying is lying — they can open the door to bigger, darker, more destructive lies.

White lies are like the gateway drug to bigger offenses. Get away with them and you're tempted to tell ever bigger ones. Eventually, your lies will catch up with you and will damage your work relationships. And in a world that is already unstable, that's not a risk you should take.

While most white lies seem harmless, consider the potential consequences. What if, for instance, the contractor you had your assistant lie to happens to find out you

actually were in the office? He may feel offended enough to tell others in the industry about your behavior.

Even more detrimental is the effect white lies can have on one's own psyche. White lies work much the same as other types of "lesser" offenses (say, flirting with that married co-worker). Basically, you become desensitized to the feelings of wrongness and guilt, and, before you know it, you are finding ways to excuse away other more serious infractions.

## No lying zone

If you're going to start classifying lies as "white" or "whoppers," you may as well categorize different levels of stealing, too. The white lie version of embezzlement could be taking a few dollars' worth of office supplies home with you, or mailing personal correspondence with company postage, or making personal copies on the company machine. Is that the standard you want to set for your employees?

**Tell the truth at all costs.** You should tell the truth even when it is not easy, cheap, popular, or convenient. Dishonesty and deception in any form can end up costing in the long run, in your professional and personal lives.

**Don't give false impressions.** When it comes to work life, false impressions are everywhere. You won't be hard-pressed to find examples of people trying to make others believe things are better

than they really are. While you may not realize it, this is just another form of lying. You have to be up front and honest with those you work with, or you may lose your credibility and build up bitterness and resentment in a once-valuable work relationship.

Think about the ways that you or your department may be misleading others, and find ways to stop it. Make sure you aren't spinning feedback to make someone feel as though they're doing better

**There are four words that should tip you off that you are headed for trouble: Any sentence that begins with "Just tell him that..." is usually followed by a lie.**

or worse than they really are. And certainly don't mislead any potential job candidate or employee about realities of compensation, advancement, or future plans.

**Never, ever ask someone else to lie on your behalf.** This is an abuse of your power, position, relationship, and friendship. Asking an employee or colleague to lie for you can do permanent damage to your integrity and reputation, and it opens the door for them to lie to you, and those you do business with, as well.

**Beware of the four magic words.** There are four words that should tip you off that you are headed for trouble: Any sentence that begins with "Just tell him that..." is usually followed by a lie. And if someone tells you to tell someone else, "Just tell him that..."

**We invite readers** to offer ideas for this regular column, designed to help municipal and utility managers deal with day-to-day people issues like motivation, team building, recognition and interpersonal relationships. Feel free to share your secrets for building and maintaining a cohesive, productive team. Or ask a question about a specific issue on which you would like advice. Call editor Ted Rulseh at 800/257-7222, or email [editor@mswmag.com](mailto:editor@mswmag.com).

you can do that person a great service by respectfully replying, "But that's not true. What should I tell him instead?"

## It's not worth it

Think of all the business scandal stories from these past few years, how many of them were the results of dishonesty, and how that dishonesty shattered the lives of so many people. That's something every professional should work to avoid.

Even though telling the truth is often the hard and unpopular thing, honesty is rule number one to developing sound character. Tell the truth because it is the right thing to do and encourage your employees to do the same. It will benefit you, and your operation, all year long. ♦

## About the Author

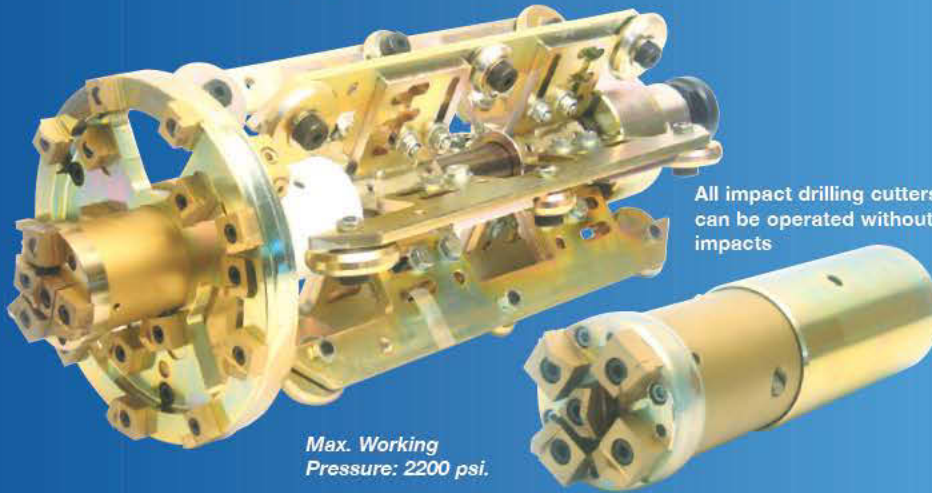
Dave Anderson, president of Dave Anderson's Learn to Lead ([www.wiley.com](http://www.wiley.com)), has given more than 1,000 leadership presentations in thirteen countries, and has authored several books. He and his wife, Rhonda, are co-founders of The Matthew 25:35 Foundation, which helps feed, educate, and house under-resourced people throughout the world.

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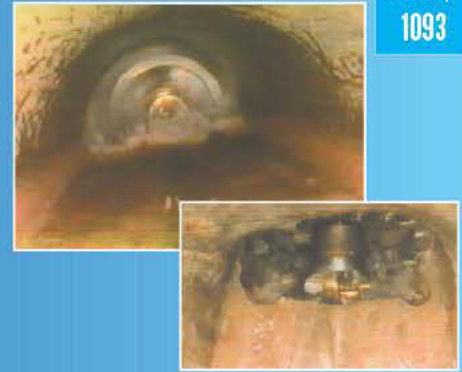
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# BIG-PICTURE THINKING

NASSCO members take part in strategic planning sessions that help identify key initiatives for 2012 and beyond

By Ted DeBoda, P.E.

Last month we looked back at NASSCO's many accomplishments in 2011, including recertification initiatives for users and trainers of the Pipeline Assessment Certification Program (PACP), our partnership with the Canadian Standards Association (CSA) to make PACP available in Canada, an online PACP review and refresher, and other initiatives that helped NASSCO further its mission.

As we enter 2012, NASSCO is taking a bold step to continue supporting these initiatives and find other ways to promote our mis-

sion. Late last summer, we began a comprehensive strategic planning process. A variety of NASSCO members with varied experiences in sewer repair and rehabilitation volunteered their time to participate in this moderated exercise.

Their thinking culminated during WEFTEC, held in Los Angeles during October. For ten straight hours, the group reviewed the data and identified the best ways to move NASSCO forward in 2012, and beyond. The resulting action items, if properly deployed, can affect not only NASSCO, but our industry as a whole. They include:

- Develop Inspector Training Certification Programs (ITCP) beyond our current CIPP focus. We will add manhole rehabilitation and pipe bursting courses in 2012, geared toward municipalities and

engineers. ITCP is a new standard national training and certification program that provides field construction professionals (consulting and municipal engineers, and contractors) with comprehensive learning and tools to understand and inspect trenchless pipeline renewal projects.

communications, especially those dealing with PACP recertification and other time-sensitive matters and deadlines, are not interrupted or delayed.

- Conduct regional PACP focus groups. This will help us uncover better processes, content, and overall improvements needed to raise the

**Late last summer, we began a comprehensive strategic planning process. A variety of NASSCO members with varied experiences in sewer repair and rehabilitation volunteered their time to participate in this moderated exercise.**

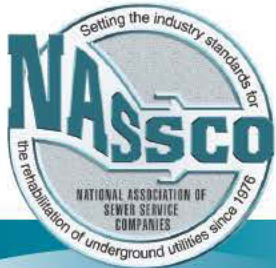
- Update and overhaul our membership and certification database to ensure that all member, ITCP, and PACP participant information is correct and current. This will ensure that important

- bar on our PACP program.
- Work with the Department of Transportation and the U.S. Army Corps of Engineers to include PACP for stormwater and levee pipelines.
- Conduct PACP training sessions in Latin America.

Other operational objectives resulted from this strategic exercise that will help streamline NASSCO processes and make the membership experience better overall.

If you're not already a NASSCO member, now is a great time to join. We are busy preparing for the 2012 Annual Meeting, which only active NASSCO members can attend. At the meeting, Feb. 15-18 at Caesar's Palace in Las Vegas, we will offer many opportunities to network and learn more about business trends, technology advances, and other educational updates for our industry. You can join us online at [www.nassco.org](http://www.nassco.org). ♦

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



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# Education Day

## Monday, February 27th

### SSCSC

#### Southern Sections Collection Systems Committee

- 8 a.m. Rust into Gold
- 9:30 a.m. Maintaining Collection System Easements
- 11 a.m. Sanitary Sewer Overflows: What To Do When It Is Flowing Down the Street
- 1:30 p.m. Finding Success and Growth in the Pipeline Cleaning Business
- 3 p.m. Evaluating and Optimizing the Efficiency of a Combination Truck
- 4:30 p.m. CCTV Inspection Essentials

### NOWRA

#### National Onsite Wastewater Recycling Association

- 8 a.m. Aerobic or Anaerobic - Which One Is Better?
- 9:30 a.m. Mound Systems – Not Just for Wisconsin!
- 11 a.m. Dead Bacteria - How Overuse of Cleaners and Household Products KILL
- 1:30 p.m. Onsite Electrical
- 3 p.m. Managing Commercial Wastewater Treatments
- 4:30 p.m. Choosing the Right Float to Control Your Pump

### NAWT

#### National Association of Wastewater Transporters

- 8 a.m. What I Need to Know About Trucking Safety
- 9:30 a.m. Setting the Dose, Establishing the Pump Delivery Rate & Relative Control Sensor Adjustment
- 11 a.m. Certification and Septic System Inspections
- 1:30 p.m. Is There Value in Processing My Own Sludge?
- 3 p.m. Maintenance Frequency Standards and Requirements
- 4:30 p.m. Working with Small Communities: System Management

### NEHA

#### National Environmental Health Association

- 8 a.m. Promoting Competence: What's in It for Me?
- 9:30 a.m. Septic Tank Science
- 11 a.m. Advanced Treatment - What Does That Mean?
- 1:30 p.m. Successfully Dosing Pipe Networks
- 3 p.m. Pump Replacement
- 4:30 p.m. The State of the Industry: The Forecast, The Strategy, The Tools

### NASSCO

#### National Association of Sewer Service Companies

- 8 a.m. Sewer Ops and CMOM - Leveraging the CMOM Process for Operational Benefit
- 9:30 a.m. Larry Keist - Developments in Water Main Linings
- 11 a.m. Culvert Rehabilitation: Have It Your Way
- 1:30 p.m. Manhole Lining: The Secret to a Successful Installation
- 3 p.m. Inspection of Pipelines Under Full Flow Conditions
- 4:30 p.m. Sewer and Industrial Equipment Rental - What are the Options?

### BUSINESS TRACK

#### General Business - Scott Hunter

- 8 a.m. Keeping Employees and Customers Happy - Part 1
- 9:30 a.m. Keeping Employees and Customers Happy - Part 2
- 11 a.m. Keeping Employees and Customers Happy - Part 3
- 3 p.m. How to be Successful and Profitable in Any Economy - Part 1
- 4:30 p.m. How to be Successful and Profitable in Any Economy - Part 2

### WJTA

#### WaterJet Technology Association

- 8 a.m. Accessorizing Your Vacuum Unit
- 9:30 a.m. Good Craftsmen Have Heavy Toolboxes
- 11 a.m. Waterjet Technology: Applications and Equipment

### PSAI

#### Portable Sanitation Association International

- 1:30 p.m. Cost Analysis: Delivery, Removal, Moves and Tip-Overs - Part 1
- 3 p.m. Cost Analysis: Delivery, Removal, Moves and Tip-Overs - Part 2

### WASTEWATER EDUCATION

#### in Association with NOWRA

- 8 a.m. Social Media: Friend or Foe?
- 9:30 a.m. Taking it to the Web, Infinity and Beyond!



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# Indianapolis 2012

## Tuesday Sessions

February 28, 2012

### MUNICIPAL TRACK

- 8 a.m.** Inspecting and Locating Laterals  
*Edward A. "Digger" Diggs - CUES, Inc.*
- 9:30 a.m.** Get Quality Results From Your Inspection Management Program!  
*Rod Thornhill, Cori Criss - Infrastructure Technologies*
- 11 a.m.** Using Chemical Grouts to Protect Mainlines, Laterals, Manholes and Lift Stations  
*Daniel Magill - Avanti International*

### SEWER AND DRAIN TRACK

- 8 a.m.** Contractors Need to Improve Jetting Sales  
*Nick Woodhead, Ken Bryson - US Jetting*
- 9:30 a.m.** Lift Station Backup Pumping  
*Majid Tavakoli - Thompson Pump*
- 11 a.m.** Optical Advancements Improve Range and Clarity of Pipeline Zoom Inspection  
*Richard Lindner - EnviroSight*

### BUSINESS TRACK

- 8 a.m.** Market Like the Green Bay Packers  
*Jerard Nighorn - Lenzyme, Inc.*
- 9:30 a.m.** Training is the Key to Unclogging a Messy Business  
*William Raymond - Nexstar Network*
- 11 a.m.** How to Make Profits That Drop Straight to the Bottom Line  
*Jenny Alday - One Biotechnology*

### PORTABLE RESTROOM TRACK

- 8 a.m.** How Your Portable Toilet Company Can Save Money By Saying "No"  
*Joel Smith - Clear Computing*
- 9:30 a.m.** New Emission Standards for Service Trucks  
*John Olson - Satellite Industries*
- 11 a.m.** New Portable Restroom Products  
*David Roncadori - J&J Chemical Co.*

### LIQUID WASTE TRACK

- 8 a.m.** What You Should Know About ATUs and How to Evaluate and Service Them  
*Doug Dent - Ecological Labs*
- 9:30 a.m.** From the Kitchen to the Grease Trap to the Landfill  
*Dennis Brunetti - FloTrend*
- 11 a.m.** The Evolution of Effluent Filters  
*Theo Terry - Bear Onsite*

## Wednesday Sessions

February 29, 2012

### PIPE RELINING TRACK

- 8 a.m.** Advances in Monitoring Technology Help Ensure Proper Liner Cure  
*Jake Wells - Pipeline Renewal Technologies*
- 9:30 a.m.** UV Cured Fiberglass Pressure Liner  
*Richard Montemarano - LightStream*
- 11 a.m.** New Braunfels Utilities Performs Manhole-to-Manhole Lining in-House  
*Travis Bohm - Perma-Liner Industries*

### INSTALLER TRACK

- 8 a.m.** Installation and Operation of Float Switches  
*Brett Willong - SJE-Rhombus*
- 9:30 a.m.** STEPPing Up  
*Dennis Hallahan P.E. - Infiltrator Systems*

### BUSINESS TRACK

- 8 a.m.** Septic, Sewer & Portable Business Valuation Basics  
*Jeff Bruss - COLE Publishing*
- 9:30 a.m.** Inexpensive Marketing, Promotion & Advertising Ideas for Septic, Sewer & Portable Companies  
*Jeff Bruss - COLE Publishing*
- 11 a.m.** Making the Most of Mobile Marketing  
*Jeff Bruss - COLE Publishing*

### GAS, OIL AND MINING TRACK

- 8 a.m.** Vacuum Equipment in the Marcellus Shale Region  
*Mark Nixon - MORO USA*
- 9:30 a.m.** How to Vacuum More Efficiently with a Positive Displacement Blower  
*Jeff Peterson - Hixon, Inc., a division of Ingersoll Rand*
- 11 a.m.** Why Choose Hydroexcavation? Opportunities in the Oil and Gas Exploration Industry  
*Neil McLean - Hydro Excavation Consulting Unlimited*

### INDUSTRY SAFETY TRACK

- 8 a.m.** Cross Bores, Deadly but Preventable - Your Actions Can Save Your Life  
*Mark Bruce - Can Clay*
- 9:30 a.m.** Is the Air in Your Manhole or Confined Space Safe to Breathe?  
*Ed Fitzgerald - Jack Doherty Companies*
- 11 a.m.** OSHA: Introduction to Soil Analysis  
*Gary Hooks*



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# PIPELINE REHABILITATION AND RELINING

By Briana Jones

## Field sleeves

**Field sleeves** from **A-LOK** can be grouted in an existing manhole to create watertight connections. The sleeves can be used in the plant, or poured in place in the field. They are available for all sizes and styles of A-LOK boot style or compression connectors and can be made for 1- to 90-inch-diameter pipe. **800/822-2565; www.a-lok.com.**



## Felt liners

**Applied Felts** offers a full line of **felt liners** for CIPP installations. All liners are manufactured in one location and are subjected to a multistage testing system. They are custom-made to exact specifications for pipe sizes from 3 to 105 inches. **276/656-1904; www.appliedfelts.com.**



## Steel trench shields

**Trench shields** from **BakerCorp** work for excavation applications of pipeline and sewer construction, horizontal drilling and boring, and repairs. The shields are pulled through the trench as work progresses, making them well-suited for pipe-laying operations. They are available in a variety of lengths and widths and can be stacked for deeper excavations. The shields can handle excavation widths from 2 to 20 feet, and depths from 4 to 20 feet. They are made of heavy-duty steel and meet OSHA standards. **800/225-3712; www.bakercorp.com.**



## Streamlined cutter

The **Dominator 430** from **Bowman Tool Company & Systems** is a 72-pound reinstatement cutter designed to operate in 6- to 30-inch lined pipe. There is no external air tube, giving the cutter a streamlined design. The head assembly is a pinion-less, quick-change design with only one adjustable gib to reduce adjustment time.

The device is configured for lateral reinstatement with the Bowman



0.8 hp or 1.2 hp crossflow air motor. Optimum performance is reached with the 2.5 hp geared air motor, which reduces reinstatement time by 80 percent. The cutter can be disassembled and reassembled in 30 minutes and has only eight moving parts. All electric motors are isolated at the end of the cutter in a watertight chamber, eliminating water damage and allowing for easy access. The cutter is manufactured from temper-hardened stainless steel and bronze to cut tough liners, including UV-cured liners. **717/432-1403; www.bowmantool.com.**

## Joint seals

The **HydraTite** internal joint seal system from **Cretex Specialty Products** is a mechanical, trenchless remediation for the repair of pipe joints. Made to eliminate infiltration and exfiltration, the seals are low profile to minimize disruption of flow in the pipe and can manage 300 psi operating pressure. The repair system has a rubber seal that spans the joint and is held in place by stainless steel retaining bands, hydraulically expanded and locked in place. Each seal is custom-made to ensure compliance with project specifications. The sealing system is a recognized method of joint repair under AWWA manual M28. **800/345-3764; www.cretexseals.com.**



## Small and large cutters

Small and large **Kangaroo cutters** from **CUES** are designed to open and reinstate wastewater service laterals, remove



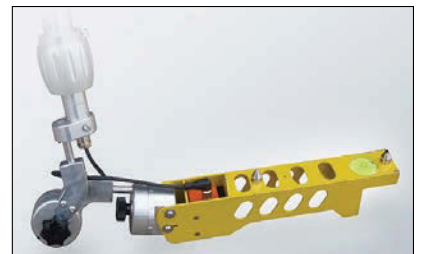
protruding taps, and brush-finish existing cuts. The cutters work in 6- to 30-inch pipe, are effective in CIPP or fold-and-form lines, and can be installed on any CCTV manufacturer's truck-mounted system. The small cutter is available with a 0.9 hp air motor for more power, increased productivity, and a smoother cut when operating in 8- to 12-inch lined pipe.

Lubrication can be used but is not necessary because of the oil-less Teflon impregnated vanes. The design prevents resin from entering the motor housing and allows for easier resin removal. Kits are available to retrofit existing cutters and service kits are available for regular maintenance intervals on existing motors. **800/327-7791; www.cuesinc.com.**

## Remote measuring

Operated from street level, the **DiaMetrik** from **Envirosight** measures the depth and width of manholes and the diameter of incoming lines to an accuracy of 0.1 inch, allowing users to configure crawlers properly, complete inspections in accordance with PACP, MACP and similar guidelines, and plan lining jobs.

A collapsible 24-foot pole and articulating measurement head enable the unit to reach every structure requiring measurement, yet it stows in the bed of a pickup. Using an industrial-grade laser, the device takes



readings from 4 inches inside pipes to compensate for any inconsistencies at the pipe mouth. It presents readings on a digital display, stores the 10 most recent measurements, offloads readings to a PC, and operates on rechargeable battery power. 973/252-6700; [www.envirosight.com](http://www.envirosight.com).

## Jet/vac truck

The **GapVax MC Series** combination **jet/vac truck** is made of 3/16-inch ASTM A572 Grade 50 Exten steel and works for hydroexcavation, jetting and water-blasting. Debris bodies range from five to 12 cubic yards. The truck has a unitized stainless steel 2,000-gallon water and debris tank with a double subframe. A heavy-duty double-acting, single-lift cylinder provides a 50-degree dump angle. Vacuum pump options range from 3,500 to 5,000 cfm and up to 27 inches Hg.



The truck comes equipped with an 8-foot front-mounted, telescopic boom with dual lift cylinders, reaching 26 feet with 270-degree rotation. The front-mounted hose reel carries 800 feet of 1-inch hose. The standard water pump is rated at 80 gpm/2,000 psi. Options include a wash-down system; hydroexcavation package; extra storage space; heated boxes; liquid-level load indicators; remote pendants and wireless remotes for boom, vacuum break, and water controls; additional work lights; and tube racks. 888/442-7829; [www.gapvax.com](http://www.gapvax.com).

## Sealing system

The **Insignia Sealing System** from **LMK Technologies** offers O-rings, connection hats and end-seal sleeves as solutions to groundwater infiltration at lateral/mainline connections and manhole penetrations. The seals swell three to five times on contact with water, forming a watertight seal.



The end-seal sleeve offers a large sealing surface, preventing it from falling over once positioned within the pipe. The seamless molding provides a uniform 360-degree compression seal. The end-seal works for pull-in-place and inversion lining. 815/433-1275; [www.performanceliner.com](http://www.performanceliner.com).

## Heated hydroexcavator

The **X-Vac X-10** hydroexcavator from **Hi-Vac Corp.** features a recirculation system that keeps water heated and continuously moving to prevent freezing. Air and water volumes can be independently controlled to provide the ideal mix for any application. Other features include a low-profile debris tank for a lower center of gravity, full-opening rear door, dual cyclone separators with material dropout box for efficient separation, and remote-controlled boom hydraulics. 800/752-2400; [www.x-vac.com](http://www.x-vac.com).



## Mechanical drill

**MDL mechanical earth drills** from **Little Beaver** offer a safe solution for one-man digging. Featuring a 360 rpm operating speed, the drills are fast and produce clean holes. The MDL-5B and MDL-5H are available with a Briggs & Stratton or Honda 5.5 hp engine, and are mounted on 8-inch semi-pneumatic tires. The MDL-8B and MDL-8H are available with a Briggs & Stratton or Honda 8 hp engine, and are mounted on 10-inch pneumatic tires.

Two kits convert the drills into horizontal boring machines. Well-suited for drilling up to 4 feet under sidewalks, the sidewalk auger kit includes a 5-foot extension, with a universal joint, and a 5-foot auger. The water drilling kit includes a water swivel and achieves horizontal drilling distances up to 40 feet. 800/227-7515; [www.littlebeaver.com](http://www.littlebeaver.com).



## Manhole ventilation

The **Ripcord Ventilator/Stringer** from **Hurco Technologies** ventilates sewer manholes and makes it easy to get ropes and cables through pipe for testing procedures. It comes in two sizes: the standard Ripcord at 4,200 cfm and the Super Ripcord at 8,000 cfm. The ventilator uses a spark-proof solid-cast aluminum impeller to ensure high airflow and high static pressures. The impeller is precision balanced for smooth performance. The unit comes with a standard 30-inch ring and fits on most manhole configurations. It can be modified for special applications. The ventilator can be used to pull deflection testing gauges through pipelines. 800/888-1436; [www.gethurco.com](http://www.gethurco.com).



## Versatile combo machine

The **Vac-Con** combination machine is available in 3.5- to 6-cubic-yard capacities with hydrostatically driven two- and three-stage centrifugal compressors or several optional positive displacement blowers up to 27 inches Hg. The unit offers a high-pressure, smooth flow water system up to 120 gpm/3,000 psi with cross-linked polyethylene water storage tanks with total capacities up to 1,500 gallons. The machine can be equipped with a 180-degree articulating front-mounted reel with 1,000 feet of 5/8- to 1/4-inch high-pressure hose.

Front-mounted telescopic booms are available with up to a 10-foot extension and 8- and 10-inch tube diameter. The optional hydroexcavation package allows users to reduce the volume of water, maintain pressure for digging, and direct flow through a conventional hand wand. A cyclone separator is available to extract and collect airborne solids in dry vacuuming situations. This can also be used to recover drill "mud" or cuttings in directional drilling operations. The unit is available with a variety of specialized pipe cleaning and excavation tools. 888/491-5762; [www.vac-con.com](http://www.vac-con.com).



(continued)

### Constant-tension winch

The **HydroGuide HG12** constant-tension winch from **HammerHead Trenchless Equipment** features a self-deploying hydraulic boom and downrigger to reduce setup time for pipe bursting, sliplining, pipe-pulling cable and swagelining. The automated boom is raised and lowered by hydraulics and extends to the required length. Once the downrigger is positioned, the support legs are dropped into place and adjusted as required. Optional features include hydraulic leveling jacks and boom extensions. Also available is the HG12AT all-terrain unit mounted on tracks to access tight locations. **800/331-6653; www.hammerheadtrenchless.com.**



### Thermosetting CIPP

The **Inliner CIPP** from **Inliner Technologies** combines a nonwoven engineered tube or liner with the choice of a wide array of thermosetting resins, chosen to fit the pipeline problem and surrounding environment. The liners span pipe from 4 to 120 inches and renew pipe with bends, diameter changes or noncircular geometries. They can be used in gravity and pressure applications. The liners can be installed in contiguous segments of several thousand feet by accessing existing manhole structures. The product can be installed via inversion or pull-in-place methods and cured by a variety of methods. **812/723-0704; www.inliner.net.**



### Complete lining

The **complete lateral system (CLS)** from **MaxLiner** seals lateral pipelines at the connection interface starting from the inside mainline and out into the lateral. The system can be installed in 90-degree bends. Laterals can be lined after the main liner has been installed, and laterals without a cleanout can be lined from the mainline. The lateral system is ICC-ES compliant. **276/656-1225; www.maxlinerusa.com.**



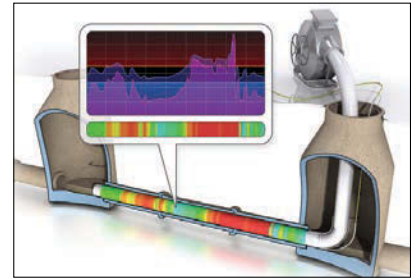
### Continuous lining

The **Top Gun F-24** system from **Perma-Liner Industries** lines 18- to 24-inch pipes with 600 plus feet of continuous air inversion lining. The unit averages 1 foot of liner inverted per 1.5 seconds. Rapid steam cure allows users to complete multiple shots in one day. The turnkey installation system comes with manifold and hoses. The pre-wet liner requires no wet-out facility. Five days of on-site training and certification are included. **866/336-2568; www.perma-liner.com.**



### Monitor cure time

The **VeriCure** system from **Pipeline Renewal Technologies** monitors cure temperature continuously along the full length of a CIPP liner. This ensures storm and sewer lines are rehabilitated to specification, and perform as intended. Designed to distinguish even small thermal variances, the system measures average temperature in successive 1.5-foot zones.



The system indicates exactly when the liner cure goes exothermic, and when cure and cool-down are complete, reducing fuel waste and the risk of failure due to undercooked midpoints or overcooked liner. The unobtrusive measurement probes are 3 mm in diameter and introduce no sensitive electronics into the pipe. They come in lengths of 500, 700 and 900 feet and are available in custom lengths. The probes are pulled into position by a crawler or jetter, then cut along the liner ends after cure is complete. **866/936-8476; www.pipeliner.com.**

### Line replacement tool

The model **PD-22** service line replacement tool from **Pow-R Mole** splits and replaces through existing lead, copper and plastic service lines from 3/4 to 2 inches. The single-person-operated machine has a compact, modular design. At 18 inches long and 14 inches wide, it has a total weight of 145 pounds. The tool has 7.5 tons of pull force. Other features include a nonslip cylinder activated jaw, out-of-pit machine controls, a detachable wheeled valve cart, and a 7 hp portable hydraulic power unit. The machine and hydraulic power unit package includes 75 feet of 3/8-inch wire rope, 3/4- to 1-inch splitter head, machine gate extension, and pipe gripper plate. **800/344-6653; www.powrmole.com.**



### High-pressure hydroexcavator

The **AllExcavate** hydro-excavator from **Vacall** includes a high-pressure water system and intelligent control system. The machine removes dirt around water, sewer, gas and other utility lines, and around foundations where mass excavation is not possible. Water pumps are available in 10, 15 and 20 gpm at 3,000 to 3,500 psi. The water system, wand, control panel, tools and worker apparel are enclosed in a heated compartment.

The AllSmartFlow CANbus control system has a programmable LCD display that monitors engine, water flow and vacuum performance while allowing more precise boom and reel adjustments. A fully proportional pendant, wired or wireless, is programmable for control away from the chassis. Water tanks are fabricated with high-quality aluminum. The oval-shaped debris body features a hydraulic tailgate. An optional flushing system cleans the interior of the body. The unit uses a single engine. **800/382-8302; www.vacallindustries.com.**



## Rod pusher/puller

The compact **Model 1915** rod pusher/puller from **Poweram** installs new underground utilities by pushing steel rods under roadways and pulling the required pipe or cable back. It also can replace existing lines by pulling pipe splitting or pipe bursting tools through the old pipe and pulling a new pipe into the same space.

The unit can pull up to 10-inch pipe in most soil conditions. Larger pipe can be installed in suitable soils. The machine locks into a safety shoring box to protect the operator and to provide a fast and stable setup. Optional leveling jacks speed setup. The pusher/puller weighs 1,000 pounds and provides over 98,000 pounds of push and over 82,000 pounds of pull. The model 2613 portable hydraulic power unit provides the right oil pressure and flow for the 1915. A backhoe, trencher, or other hydraulic power source also may be used. 715/537-9050; [www.poweram.com](http://www.poweram.com).



## Shoring device

The **pneumatic shoring device** from **Prospan Manufacturing** is made of lightweight anodized aluminum. The maintenance-free unit uses user-friendly tabulated data. The device comes with a large selection of extensions and end attachments. 888/413-8100; [www.prospanshoring.com](http://www.prospanshoring.com).



## CIPP lining

The **CIPP sewer lateral lining system** from **Quik-Lining Systems** allows users to install pipe directly from the wet-out stage into the ground without transporting, storing or loading it into the launching device. The system feeds unlimited lengths of resin-impregnated liner from 3 to 8 inches in diameter and can handle all products designed for an inversion-type installation.

The pinch roller allows precise calibration of up to 10-inch-diameter CIPP tube and any design thickness from 2 to 100 mm. The cart-mounted, propane-driven heater delivers 199,000 Btu/hr curing liners quickly and allows users to operate it indoors. Water and air manifolds are available. 714/296-5262; [www.quiklining.com](http://www.quiklining.com).



## Plastic pipe cutter

The powered plastic **pipe and tube cutter** from **RIDGID** provides up to 250 cuts per charge. The unit has a cutting capacity of up to 1 5/8 inches outside diameter on multilayer, polyethylene, polypropylene, PEX, rubber hose, PVC and CPVC. The 75-watt motor allows the ultrasharp, pointed X-CEL blade to cut in four seconds. Repeat cuts can follow by using the push-button blade release. The cutter is designed with



a pistol grip for an ergonomic feel and firm hold. The blade is replaceable without tools by removing the quick-change pin. There is an LED at the front of the tool and a battery indicator on the back. 800/769-7743; [www.ridgid.com](http://www.ridgid.com).

## Compact hydroexcavator

The **Ram Vac HX12-27** hydroexcavator from **Sewer Equipment Co. of America** has a short wheelbase and small turning radius for tight working conditions. It features a 5,200 cfm positive displacement blower that produces 27 inches Hg of vacuum and a 12-yard debris tank. The rear-mounted boom rotates 320 degrees and has 24 feet of reach.

Other features include a Temperature Controlled Environmental Chamber that houses two 750-gallon, 3/4-inch-thick Duraprolene water tanks and a hydraulic water pump that delivers up to 10 gpm/2,500 psi. The unit also has a 400,000 Btu water heater, hose reel, wireless remote, three-stage twin-cyclonic filtration system, and NEMA 4 electrical system. 800/323-1604; [www.sewerequipment.com](http://www.sewerequipment.com).



(continued)



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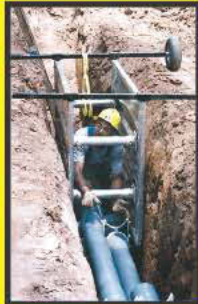
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PIPELINE REHABILITATION

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The **Mud Dog 650** hydroexcavator from **Super Products** carries a 6.5-cubic-yard debris dump body and a 500-gallon freshwater tank. It is designed in response to the growing need for a smaller truck-mounted unit. A single-engine design reduces fuel and maintenance costs. The water system delivers up to 10 gpm/2,500 psi while the 8-inch positive displacement vacuum system provides 3,600 cfm/18 inches Hg vacuum. 800/837-9711; [www.muddogeasy.com](http://www.muddogeasy.com).



**Long operation**

The **HXX Hydroexcavator** from **Vector Manufacturing** handles pipe and line installation, potholing, water-line repair, slot trenching, directional drilling, sign and pole installation and other large-volume excavations. The unit provides up to seven hours of continuous operation with onboard water. Other features include 12-cubic-yard debris tank, 1,200-gallon superlinear HL polyethylene insulated water tank, and 320-degree rotating boom. Heated pump and cabinets and built-in boiler enable the unit to work on frozen ground in subzero temperatures. 800/672-3171; [www.vector.com](http://www.vector.com).



**Epoxy-coated skids**

Epoxy-coated **proofer and skids** from **Max-Life Mfg.** were developed for use in relined pipes and won't cut or scratch the new liner. Skids are coated with Scotchkote, a fusion-bonded epoxy coating. It's been tested and found to have negligible wear to relined pipe. 888/873-6295; [www.flexmax.com](http://www.flexmax.com).



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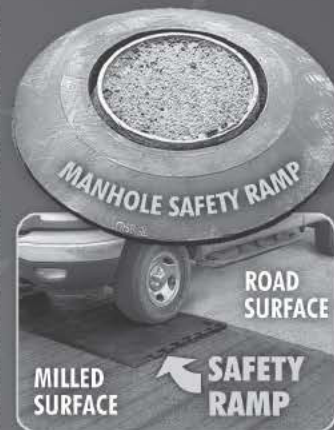
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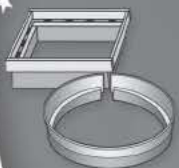
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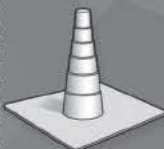
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## System lines potable water pipes

### Problem

A shopping center in Zanesville, Ohio, had a break in the copper water pipe running beneath the building and paved parking lot.

### Solution

The contractor considered the length of the deteriorated pipe, its location, and the urgency of restoring service to the tenants, then selected the **Neofit potable pipe lining system from Flow-Liner**. Technicians lined 260 feet of 1-inch pipe and 20 feet of 3/4-inch pipe using one excavated pit at the curb stop and another at the building.



### RESULT

The lining process minimized tenant disruption and restored service the same day. 800/348-0020; [www.flow-liner.com](http://www.flow-liner.com).

## Structural drain liner cures lift station problem

### Problem

During the rainy season, Sarasota County (Fla.) Utilities hauled 1.4 million gallons of excess wastewater from a lift station to its Water Reclamation Facility in Venice to prevent overflows. Infiltration through broken and cracked pipe joints was costing the county overtime and hauling expenses while putting an unnecessary load on the treatment plant.

### Solution

**Nu Flow Technologies used its lateral connection liner** to line the laterals from the city main to homeowners' property lines. Root intrusion, infiltration, and exfiltration were common at these points in the system. Once workers completed the rehabilitation, the lift station was self-sufficient again.



### RESULT

"We are seeing a great reduction of infiltration and inflow in the Hill View basin area," says Rodney Jones, operations supervisor II with the utility. 800/834-9597; [www.nuflowtech.com](http://www.nuflowtech.com).

## Single-pass hydraulic saw saves time

### Problem

The City of Little Elm, Texas, needed to replace three underground valves on 20-inch mains. The in-ground pipes required the local utility contractor to make numerous wedge cuts using cutoff saws with circular blades. This was time-consuming.

### Solution

The local **ICS, PowerGrit distributor supplied an 880PG PowerGrit direct-drive hydraulic saw** that allowed the contractor to work from one side of the main, safely and efficiently cutting through it in one pass. The saw continued working even when submerged.



### RESULT

The contractor performed each cut in less than one-fifth the time it took with the cutoff saws. 800/321-1240; [www.powergrit.com](http://www.powergrit.com).

## Pipe bursting helps cure I&I

### Problem

Inflow and infiltration increased winter flow rates by five times the dry-weather rate at the Ross Valley Sanitary District in San Rafael, Calif. The district assembled a pipe bursting division as part of its trenchless repair campaign to replace more than 16 miles of aging sewer lines and adjoining lower laterals.

### Solution

The district chose the compact **M50 pipe bursting system from TRIC Tools** to replace 6-inch vitrified clay mains with 8-inch high-density polyethylene pipe. A 14 gpm/5,000 psi trailer-mounted TRIC/WIT pump powers the ram with 48 tons of pulling force and 19.24 square inches of piston area. The equipment fits easily in easements and other tight places.



### RESULT

The district estimated savings of 50 percent over open-cut replacement and a 40 percent reduction over subcontracting the work. 888/883-8742; [www.trictools.com](http://www.trictools.com).



## Horizontal directional drilling simplifies installation

### Problem

An upgrade and expansion project at the James A. Loughlin Wastewater Treatment Plant in Wilmington, N.C., increased capacity to 16 mgd, but an existing 30-inch force main was permitted to only 12 mgd. The Cape Fear Public Utilities Authority put out a request for a second 30-inch parallel force main passing through a spongy right-of-way and under Smith Creek.

### Solution

General contractor TA Loving and horizontal directional drilling subcontractor Environmental Crossings set a boring rig in the middle of the 2,600-foot-long alignment, then drilled and pulled in both directions. Close coordination among the



parties overcame site complications. Finding 1,200 feet of layout space for the Smith Creek shot was a challenge, since the drill rod exited on a landlocked parcel with restricted access. The second run included crossing a railroad siding while pulling back 1,400 feet of 30-inch fusible PVC pipe from Underground Solutions.

### RESULT

The project was successful. 858/679-9551; [www.underground-solutions.com](http://www.underground-solutions.com). ♦

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## Elgin Equipment Group Acquires Cook Legacy Coating

Elgin Equipment Group acquired Cook Legacy Coating Co., designer of water intake structures. Cook's core products include Coanda and cylindrical screens, AirBurst systems and Jacquelyn Coating. Cook Legacy is based in Canal Winchester, Ohio, with a location in Atlanta. The company will be known as Cook Legacy Water & Energy. Its operations will merge into Elgin Equipment Group's Norris Screen LLC.

## FS Solutions Adds Online Courses

FS Solutions added two advanced online training courses to help customers increase job safety, operation efficiency and regulatory compliance. The courses, Estimating the Vacuum Job and Maximizing the Power of Waterjetting Through Tip and Hose Selection, target experienced professionals seeking training beyond the fundamentals. The online courses include tests that each individual must pass with a grade of at least 80 percent to receive certification.

## General Pipe Cleaners Redesigns Website

General Pipe Cleaners' redesigned website, [www.drainbrain.com](http://www.drainbrain.com), provides quick access and details on drain cleaning machines, high-pressure waterjets, video pipe inspection and location systems, water leak locators, pipe freeze kits, pipe thawing machines, cables and cutters.

## National Plant Services Hires Development/Project Manager

Environmental maintenance company National Plant Services Inc. hired Lori S. Weiss as business development project manager. She brings 25 years of experience in municipal utility management, facility and industrial planning and environmental compliance to her position. For the past 15 years, her primary focus has been wastewater and stormwater collection system maintenance and operations.

## Select Environmental Services Redesigns Website

Select Environmental Services Inc. redesigned its website, [www.selectenvironmentalsvs.com](http://www.selectenvironmentalsvs.com), providing information on the company's manhole rehabilitation programs for municipalities and industrial wastewater treatment plants.

## Spartan Tool Hires Territory Manager

Spartan Tool LLC named Patrick Stillmunks territory manager, responsible for sales, service and customer support in Texas and portions of Louisiana and Arkansas. Stillmunks brings 16 years experience as a licensed plumber and septic service technician to his position.

## GeoTree Technologies Partners with IRP

GeoTree Technologies Inc., an infrastructure repair material company, partnered with trenchless contractor IRP to produce IRP EcoCast, an eco-friendly, geopolymer liner repair system.

## Cityworks Names International Business Development Manager

Cityworks, provider of GIS-centric management solutions, named Phil Mogavero international business development manager. Based in Buffalo, N.Y., he had been senior regional account manager for the Northeastern U.S. Region since 2006.

## Echologics Signs Three-Year Leak Detection Contract

Echologics, developer and provider of acoustic-based technologies for water loss management, leak detection and pipe condition assessment, signed a three-year master services contract from United Water. The agreement enables any operating division of United Water to utilize Echologics leak detection and condition assessment services. ♦



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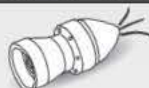


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# Product Spotlight

Energy-Saving Compactor Designed for Long Life, Safe Operation

By Ed Wodalski



Super Energy Efficient Compactor from Wastequip

**T**he Super Energy Efficient 4-cubic-yard self-contained compactor from Wastequip holds up to 24 bags of trash in its charge box, twice the volume of 2-yard, self-contained units. The compactor is powered by a Super E Series cool-running motor. The larger charge box and motor mean 65 percent less electricity consumed.

Because the size of the box is doubled, the compactor runs half as many cycles, reducing maintenance costs by 30 to 50 percent, says Kirk Warren, director of product management. A third component to the energy savings is operator education.

“The behavior we witnessed was users throwing in varying amounts of trash, pressing the button and walking away,” Warren says. “We tried to get them to change that behavior and only operate the equipment when they needed to. So instead of throwing in two or three bags, wait until you fill it up to run a cycle and you’ll maximize your savings.”

The compactor has a real-time monitor with infrared camera for through-the-wall installations, allowing operators to see what is in the charge box. The night-vision camera and remote digital monitor provide an extra layer of safety.

“For various reasons, people will try to climb in,” says Warren. “Some do it to keep warm at night, some to avoid being detected, some because they’re playing hide-and-seek. While we have safety measures to keep the equipment from operating when the door is left open this feature allows the operator to look inside, without the need for any lighting, to make sure the charge box is clear and can be operated.”

The compactor also has two Watch Dog timers. The first shuts the unit down if the ram runs for more than two minutes in any one direction — this prevents overheating. A second timer shuts the unit down after five minutes of continuous cycling (this timer can be adjusted based on customer requirements).

An Automatic Maintenance Scheduler triggers an indicator light, alerting operators when preventive maintenance is due. “That has gone over pretty well with customers,” Warren says. “They don’t have to remember once a year or every six months — it’s based on actual usage.”

To maximize hydraulic performance, the compactor has 1/2- and 3/4-inch dripless quick-disconnects, about 33 percent larger than standard disconnects, allowing quicker hydraulic flow. “So again, we’re trying to use less energy by reducing hydraulic flow friction,” says Warren. “If you use it less often, the components last longer. That’s what we’re looking to do — extend the equipment life as long as we can.” 877/468-9278; [www.wastequip.com](http://www.wastequip.com); Expo booth 2025.

## RIDGID Offers One-Touch Digital Monitor

The one-touch SeeSnake CS10 digital monitor from RIDGID records video and still images. The unit features image playback and auto-log recording that compresses files to save memory on the USB stick. The 12.1-inch monitor with enhanced daylight readability comes with SeeSnake HQ software, a PC-based program that allows images and inspection video to be imported and stored on a computer for media sharing through PDF reports and DVDs. 800/769-7743; [www.ridgid.com](http://www.ridgid.com); Expo booth 8000.



## CAS Dataloggers Offers Universal Data Logger

The battery-powered Grant Squirrel SQ2010 portable universal input data logger from CAS Dataloggers Inc. features up to eight analog input channels capable of measuring temperature at 0.1 percent accuracy as



well as recording humidity, current, voltage and resistance. The unit automatically triggers or stops logging and has two alarm/relay outputs. Other features include a built-in two-line by 40-character LCD display and keypad. Readings are recorded to the logger’s 16 MB internal memory, storing up to 1.8 million readings with USB connectivity to a PC for download as well as optional Ethernet or RS232 connections. 800/956-4437; [www.dataloggerinc.com](http://www.dataloggerinc.com).

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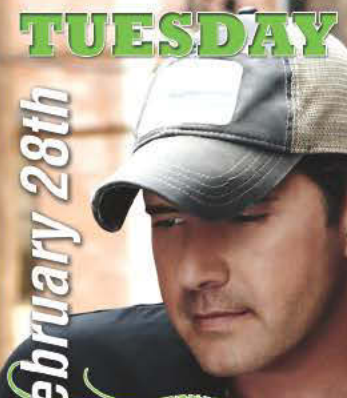
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**VFC200P-5T, FUJI** Pumps, Regenerative Blowers, Ring Compressors. All models, accessories. Authorized distributor. Authorized parts and repair center. Call 888-227-9822. [www.carymfg.com](http://www.carymfg.com). (MBM)

## CATCH BASIN CLEANER

2008 American La France Condor with a new VacAll VS10DC, 10-yd. debris body, dual steer dual sweep street sweeper and catch basin cleaner. (Stock #1791V) [www.VacuumSalesInc.com](http://www.VacuumSalesInc.com), (888) VAC-UNIT (822-8648). (CM01)

## DEWATERING



**Filter Press Rental:** Pressure Tech, Inc. has for rent, trailer mounted presses, stationary presses and shakers. We also keep in stock any other equipment you may need to meet your dewatering needs. Before you buy be sure to get a quote with us!

Visit us online at [www.ptequipmentrental.com](http://www.ptequipmentrental.com), email [tstapleton@pressuretechinc.com](mailto:tstapleton@pressuretechinc.com) or call Tim at 606-834-1545 KY

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## HAZARDOUS WASTE UNITS

POWERVAC 3800, 3,000 U.S. gallon, carbon steel Vacuum tanker with a Hibon PD blower 3800 SCFM with vacuum to 28" mercury. High Dump Type; D.O.T. 407/412 regulations (Stock #13478V) [www.VacuumSalesInc.com](http://www.VacuumSalesInc.com), (888) VAC-UNIT (822-8648). (CM01)

1999 Sterling cab & chassis with a Cusco Turbovac 3800 industrial loader with a jetting system. (Stock #3163C) [www.VacuumSalesInc.com](http://www.VacuumSalesInc.com), (888) VAC-UNIT (822-8648). (CM01)

New 3,200 U.S. gallon, carbon steel, D.O.T. certified 407/412 vacuum tank; dump type with full open rear door and a Presvac PVB 750 vacuum-pressure pump installed on a 2012 Peterbilt, 348 cab and chassis. (Stock #13490C) [www.VacuumSalesInc.com](http://www.VacuumSalesInc.com), (888) VAC-UNIT (822-8648). (CM01)

POWERVAC 3800, 3,250 US gallon, carbon steel vacuum tanker with a Hibon PD blower, 3800 SCFM with vacuum to 27" mercury. Dump type; DOT 407/412 regulations installed on a 2009 Sterling tri-axle. (Stock #4931) [www.VacuumSalesInc.com](http://www.VacuumSalesInc.com), (888) VAC-UNIT (822-8648). (CM01)

## JET VACS



**2006 Sterling LT9500 Vac Truck:** Acert C-13, Fuller 8LL, lockers, 18/40 axles, 4x6 drive, air ride, 24K miles, 208" WB, 227" frame behind cab, 22.5 tires, engine brake, disc wheels, 2006 Presvac tank, s/n: APV-4000-0705-7052, 4,000 gal. tank, Masport pump.....\$89,500  
715-546-2680 WI MBM

2008 Sterling LT7501 with a VacAll AJV1015, 10-yd. debris body, 1,500-gallon water, combination vacuum/jetting unit. (Stock #13366) [www.VacuumSalesInc.com](http://www.VacuumSalesInc.com), (888) VAC-UNIT (822-8648). (CM01)

## JETTERS: TRUCKS

2006 GMC TC6500 cab and chassis with Pipe Hunter Trunk Mounted Jetting Unit, 3,000 psi @ 50 gpm with a 1,000 US gallon water tank, rear mounted hose reel with JET EYE Camera System. **6,800 original miles, like new. \$119,000 sale price. (Retail for \$210,000)** (Stock #13234V) [www.VacuumSalesInc.com](http://www.VacuumSalesInc.com), (888) VAC-UNIT (822-8648). (CM01)

## PIPELINE REHABILITATION

Growing Pipe Rehabilitation Company seeking 6 experienced Cured in Place Pipe (CIPP) installers/laborers, one(1) foreman, one(1) supervisors for large Pipe Rehab lining project in North Washington DC area. ROLE: Under the direction of the crew foreman, the Installation Operator/Laborer will conduct all the daily routine activities associated with trench-less pipe rehabilitation installation in a safe and efficient manner. RESPONSIBILITIES: CONDUCT CENTER TO CENTER MANHOLE IDENTIFICATIONS, EXECUTE, CLEANING AND TV WORK REQUIRED FOR PROJECT, PASS OUT NOTICES TO RESIDENTS AND BUSINESSES AS INSTRUCTED, CUT TABS, INSTALL LINER, OPERATE BOILER AND STEAM EQUIPMENT, WATER METER INSTALLATIONS, OPERATE VECTOR TRUCK, SET UP EQUIPMENT, ASSEMBLE AND DISASSEMBLE HOUSE AND COUPLINGS, SCAFFOLDING OPERATIONS, UTILIZE ALL SAFETY EQUIPMENT, AND FOLLOW STANDARD OPERATING PROCEDURES, ANY OTHER TASK AS DIRECTED. Great opportunity to join a growing team. Competitive compensation and benefits. Please submit resume for consideration. Only experienced candidates will be considered. Email your resume to [IPPCareer@teamipr.com](mailto:IPPCareer@teamipr.com) EEO. DC. (M01C02)

4" Percussion Milling Cutter Enz Golden Jet for 3/4" - 1" hose version 14.100. LIKE NEW - used on one job! \$3,500. Plumbing Anytime, Inc. 307-733-3534 WY. (CMBM)

## PUMPS

**Buy & Sell** all makes and models, **new & used** vacuum pumps & high pressure water pumps, and good used replacement parts. Call for an inventory sheet and save. [www.VacuumSalesInc.com](http://www.VacuumSalesInc.com), (888) VAC-UNIT (822-8648). (CM01)

## RENTAL EQUIPMENT

Liquid vacs, wet/dry industrial vacs, combination jetter/vacs, vacuum street sweeper & catch basin cleaner, truck & trailer mounted jetters. All available for daily, weekly, monthly, and yearly rentals. **VSI Rentals, LLC, (888) VAC-UNIT (822-8648) www.vsirentalsllc.com.** (CM01)

## SERVICE/REPAIR

**Dynamic Repairs - Inspection Camera Repairs:** 48 hour turn-around time. General Wire, Ratch, Ridgid, Electric Eel, Gator Cams, Insight Vision, Vision Intruders. Quality service on all brands. **Rental equipment available.** For more info. call Jack at 973-478-0893. Lodi, New Jersey. (MBM)

## TV INSPECTION

The Clark County Water Reclamation District is seeking vendors capable of supplying *Supervision* SVC100 pan/tilt/zoom camera with SV140 crawler, SVC100 pan/tilt/zoom camera shall include: laser diodes, 4X optical zoom plus 4X digital zoom, 1 lux light sensitivity. Other features include: iris, focus, shutter and gain controls. SV140 crawler 6"-24" pipe shall include: automatic lift, rear view camera, inclinometer, 512 Hz sonde, 6 small rubber wheels and 4 large rubber wheels. Response to this request should be addressed to Jean Hutton via email: [jhutton@cleanwaterteam.com](mailto:jhutton@cleanwaterteam.com) or by phone at 702-668-8097. NV. (CM01)

New Cyclops Electronics Value-Pack IV Standard P&T Color Camera. Heavy duty transporter, all-in-one controller for camera, lights, reel and transporter, 15" LCD monitor, DVD rec/player, keyboard data system with on-screen footage, motorized reel with 500' TV/tow cable. All for only \$32,700. Call 830-249-9756 and talk to the guys that build 'em. (CM01)

## VACUUM LOADERS

1999 Sterling cab & chassis with a Cusco Turbovac 3800 industrial loader with a jetting system. (Stock #3163C) [www.VacuumSalesInc.com](http://www.VacuumSalesInc.com), (888) VAC-UNIT (822-8648). (CM01)

1999 International with a Guzzler Ace 27" HG wet/dry industrial vacuum tank loader. **Demo/Rental unit.** (Stock #7390) [www.VacuumSalesInc.com](http://www.VacuumSalesInc.com), (888) VAC-UNIT (822-8648). (CM01)

POWERVAC 3800, 3,250 US gallon, carbon steel vacuum tanker with a Hibon PD blower, 3800 SCFM with vacuum to 27" mercury. Dump type; DOT 407/412 regulations installed on a 2009 Sterling Triaxle. (Stock #4931) [www.VacuumSalesInc.com](http://www.VacuumSalesInc.com), (888) VAC-UNIT (822-8648). (CM01)

POWERVAC 3800, 3,000 U.S. gallon, carbon steel Vacuum tanker with a Hibon PD blower 3800 SCFM with vacuum to 28" mercury. High Dump Type; D.O.T. 407/412 regulations (Stock #13478V) [www.VacuumSalesInc.com](http://www.VacuumSalesInc.com), (888) VAC-UNIT (822-8648). (CM01)

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# WORTH NOTING

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

## AWARDS

The village of Montgomery received the 2011 Stormwater Management award from the Illinois Association for Floodplain and Stormwater Management.

## LEARNING OPPORTUNITIES

### APWA

The American Public Works Association is offering these Audio/Web courses:

- Jan. 17 – How the Effective Utility Management Tool Will Significantly Improve Your Public Works Department
  - Jan. 19 – Self Assessment: A Checklist for Improvement
  - Feb. 9 – Recycled Materials in Construction: Divert That Waste Stream
  - Feb. 23 – Understanding the Required EVT (Emergency Vehicle Training) for Fleets
- Visit [www.apwa.net](http://www.apwa.net).

### ASCE

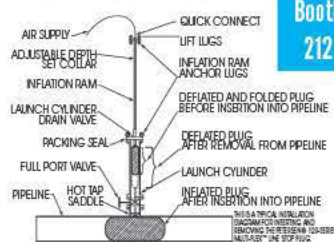
The American Society of Civil Engineers has these courses:

- Jan. 4-6 – Pumping Systems Design for Civil Engineers, Las Vegas
- Jan. 19-20 – Stormwater Treatment Using Detention Ponds and Commercial Devices, Austin, Texas
- Jan. 24 – Sustainable Stormwater Hydrology: Concepts to Reduce Hydrologic Footprint, online
- Feb. 9 – Pumping Systems Design for Civil Engineers, Chicago
- Feb. 14 – Stormwater BMPs: What Works, What Doesn't and What About Maintenance, online

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## CALENDAR

### Jan. 10-12

South Dakota Association of Rural Water Systems Annual Conference, Pierre. Visit [www.sdarws.com](http://www.sdarws.com).

### Jan. 30-Feb. 2

American Water Works Association/Water Environment Federation Utility Management Conference, Hyatt Regency Miami, Fla. Call 703/684-2441 or visit [www.wef.org](http://www.wef.org).

### Feb. 13-15

Iowa Rural Water Association Annual Conference, Coralville. Visit [www.iowaruralwater.org](http://www.iowaruralwater.org).

### Feb. 13-16

Colorado Rural Water Association Annual Conference, Colorado Springs. Visit [www.coloradoruralwaterassociation.club.officelive.com](http://www.coloradoruralwaterassociation.club.officelive.com).

### Feb. 14-16

North Dakota Rural Water Systems Association Annual Conference, Fargo. Visit [www.ndrw.org](http://www.ndrw.org).

### Feb. 22-24

Montana Rural Water Systems Annual Conference, Great Falls. Visit [www.mrws.org](http://www.mrws.org).

### Feb. 27-March 1

American Water Works Association Membrane Technology Conference & Exposition, Glendale, Ariz. Visit [www.awwa.org](http://www.awwa.org).

### Feb. 27-March 1

Pumper & Cleaner Environmental Expo International, Indiana Convention Center, Indianapolis. Call 866/933-2653 or visit [www.pumpershow.com](http://www.pumpershow.com).

### Feb. 27-March 2

Rural Water Association of Utah Annual Conference, St. George. Visit [www.rwau.net](http://www.rwau.net).

### Feb. 28-March 1

Delaware Rural Water Association Annual Conference, Harrington. Visit [www.drwa.org](http://www.drwa.org).

### March 12-16

National Utility Contractors Association Annual Convention, Fort Worth, Texas. Call 703/358-9300 or visit [www.nuca.com](http://www.nuca.com).

### March 26-28

American Water Resources Association Spring Specialty Conference, Sheraton New Orleans Hotel. Visit [www.awra.org](http://www.awra.org).

- Feb. 29 – Stormwater Management Alternatives for Small Commercial Sites, online
- Visit [www.asce.org](http://www.asce.org).

## Wisconsin

The Department of Natural Resources is offering these courses:

- March 1 – IT/Security, Madison
  - March 8 – Utility Management Training, TBA
- Visit [www.dnr.state.wi.us](http://www.dnr.state.wi.us).

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

- Jan. 11-13 – Improving Public Works Construction Inspection Skills, Las Vegas
  - April 12-13 – Using WinSLAMM to Meet TMDL, LID and MS4 Stormwater Requirements, Madison
- Visit [www.epdweb.engr.wisc.edu](http://www.epdweb.engr.wisc.edu). ♦



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