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December 2008

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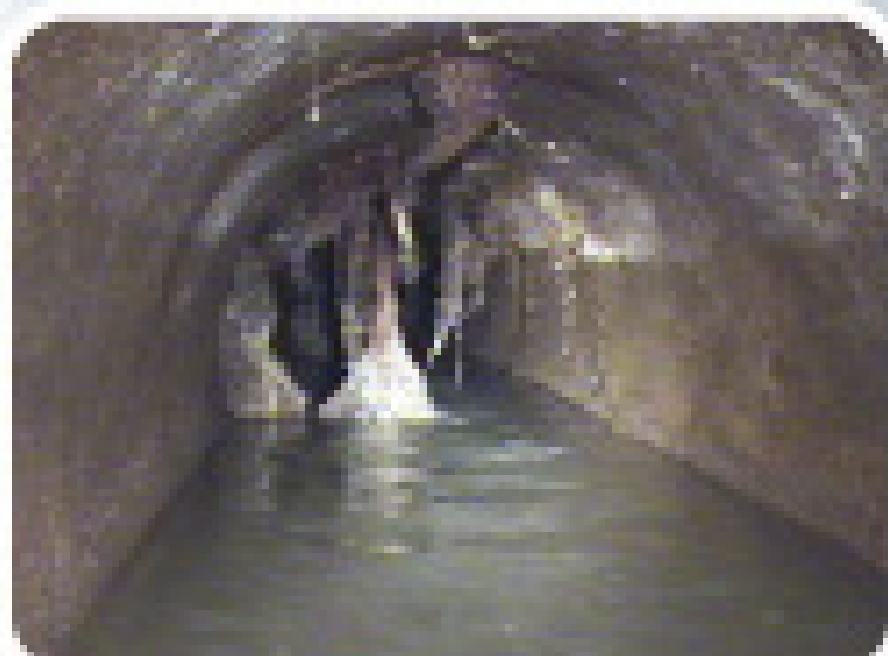
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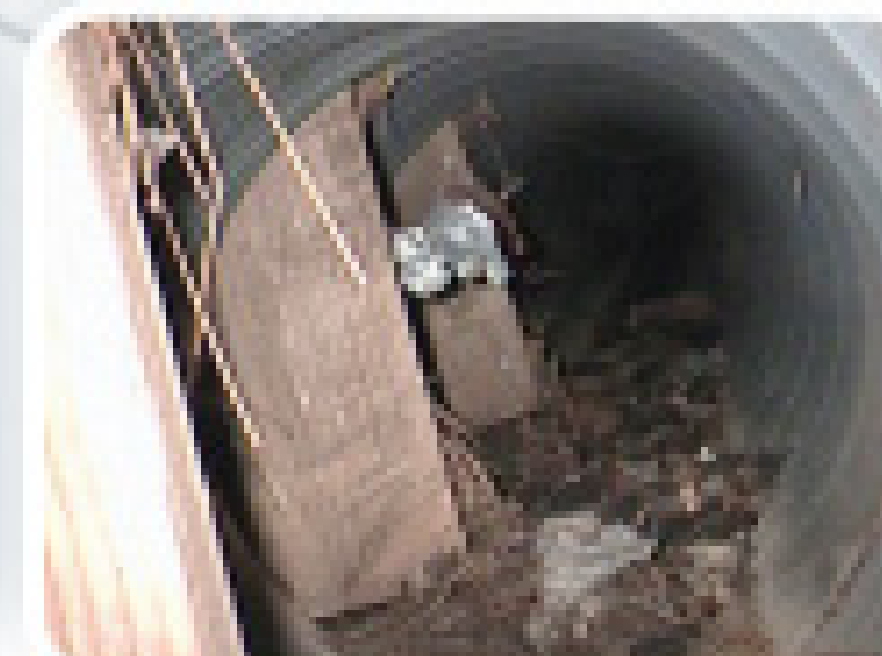
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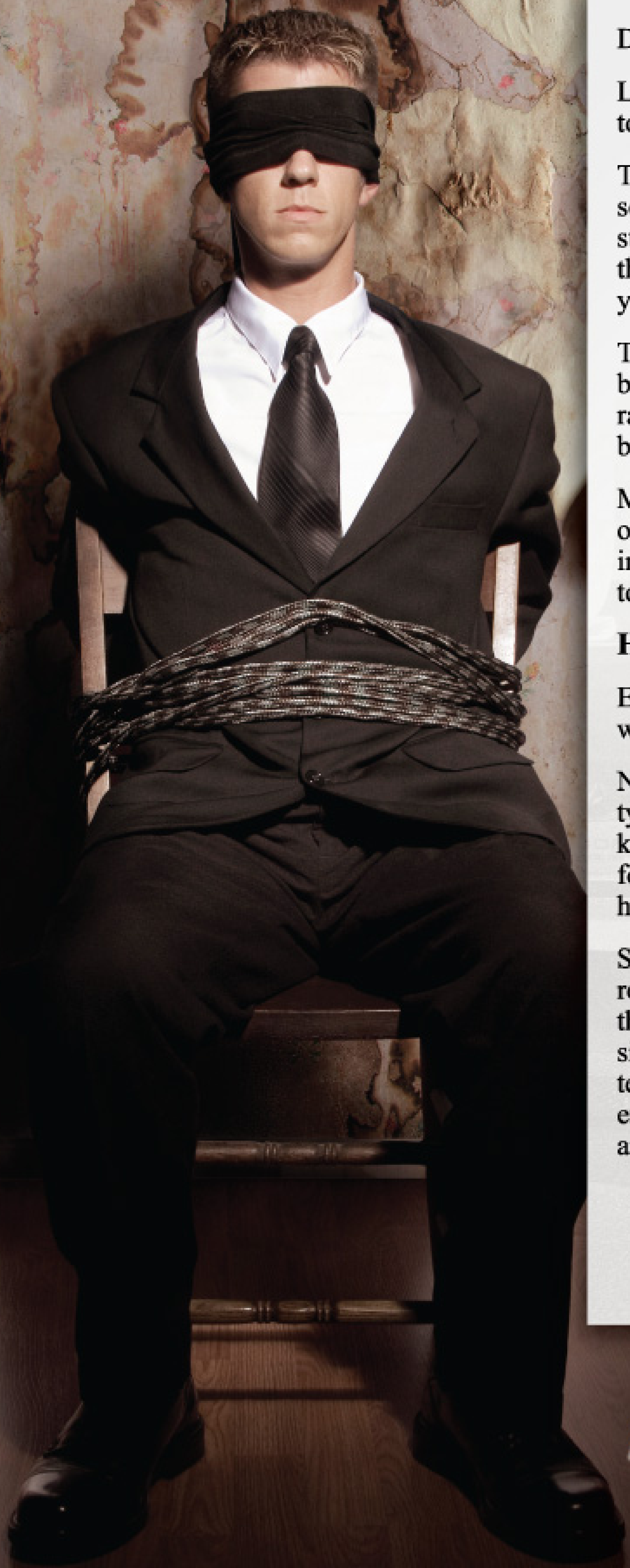
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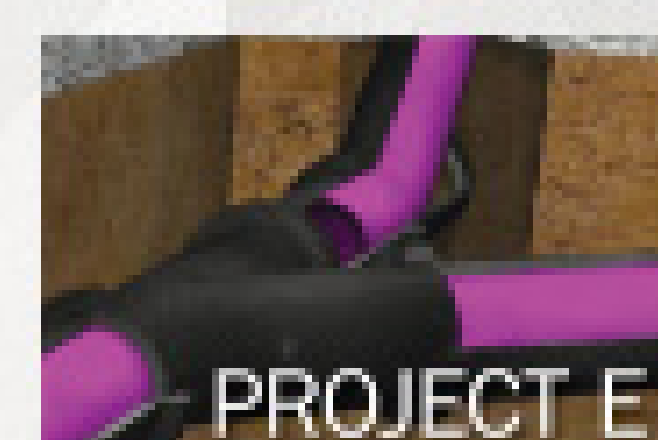
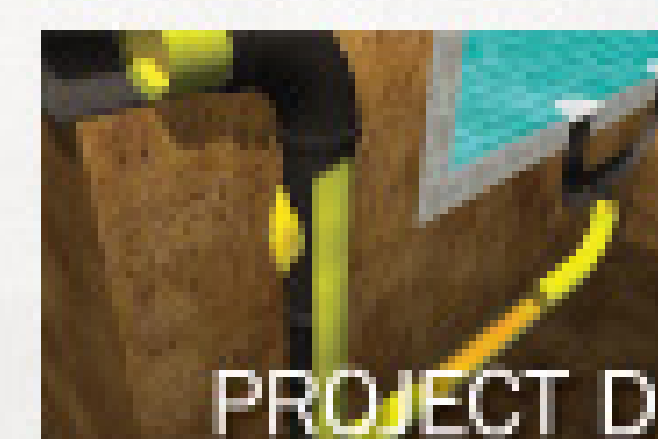
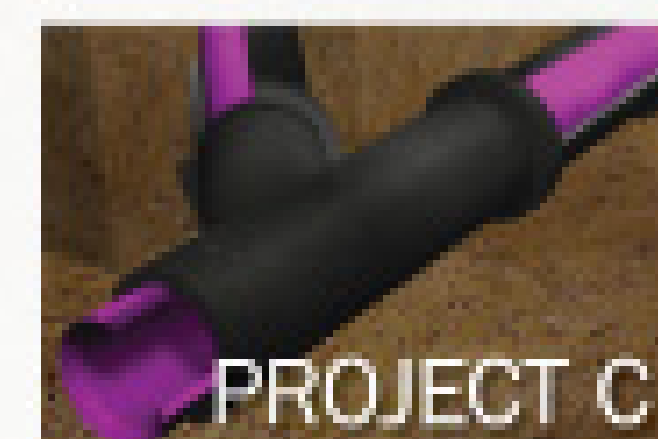
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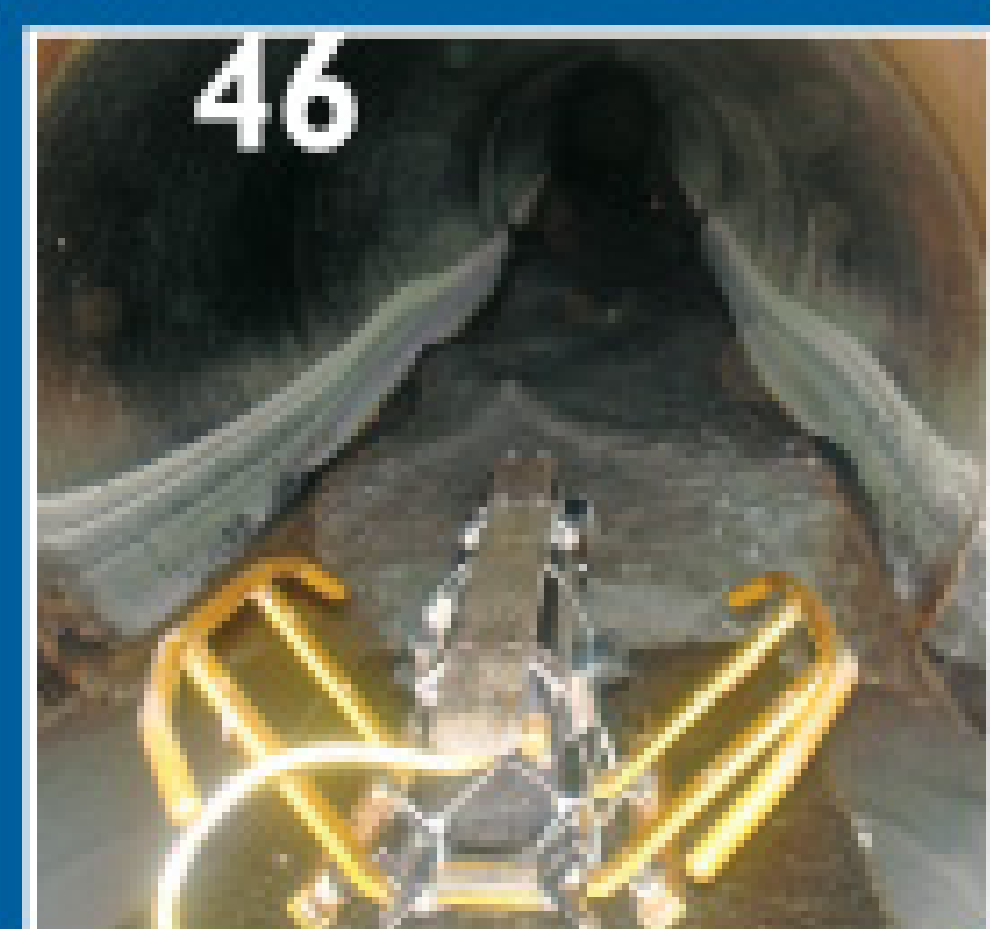
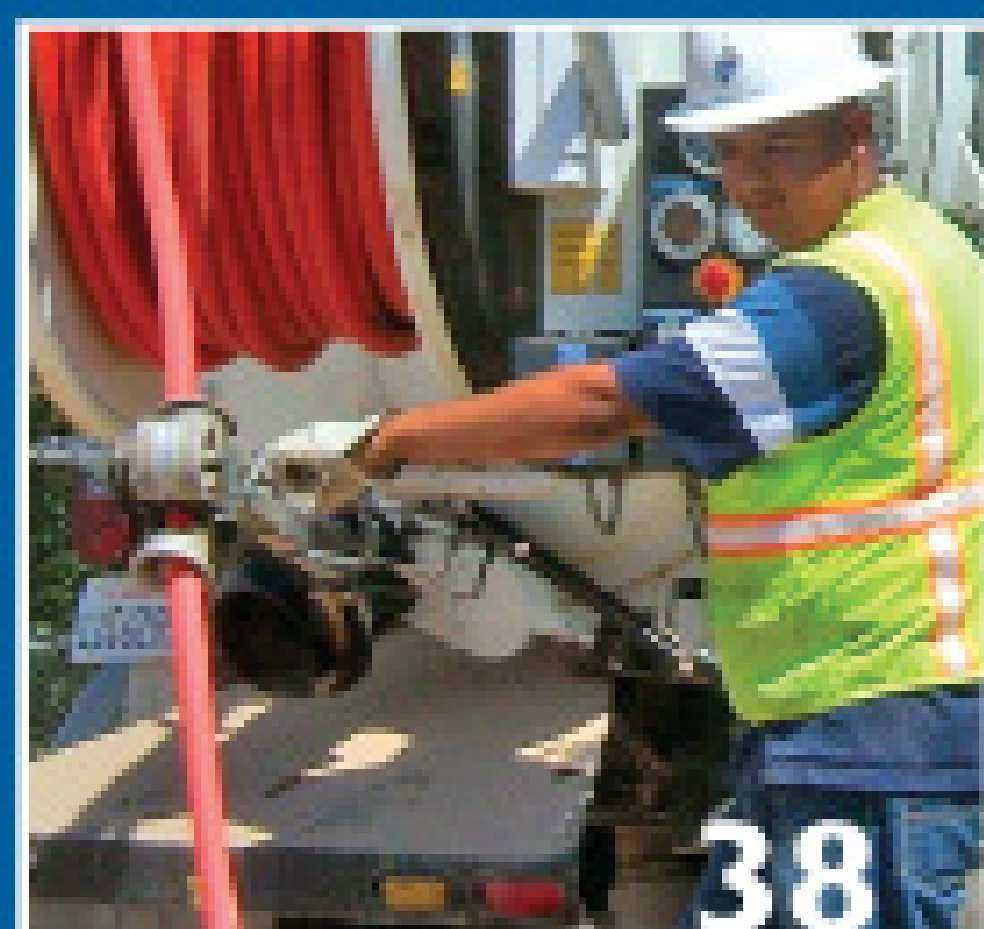
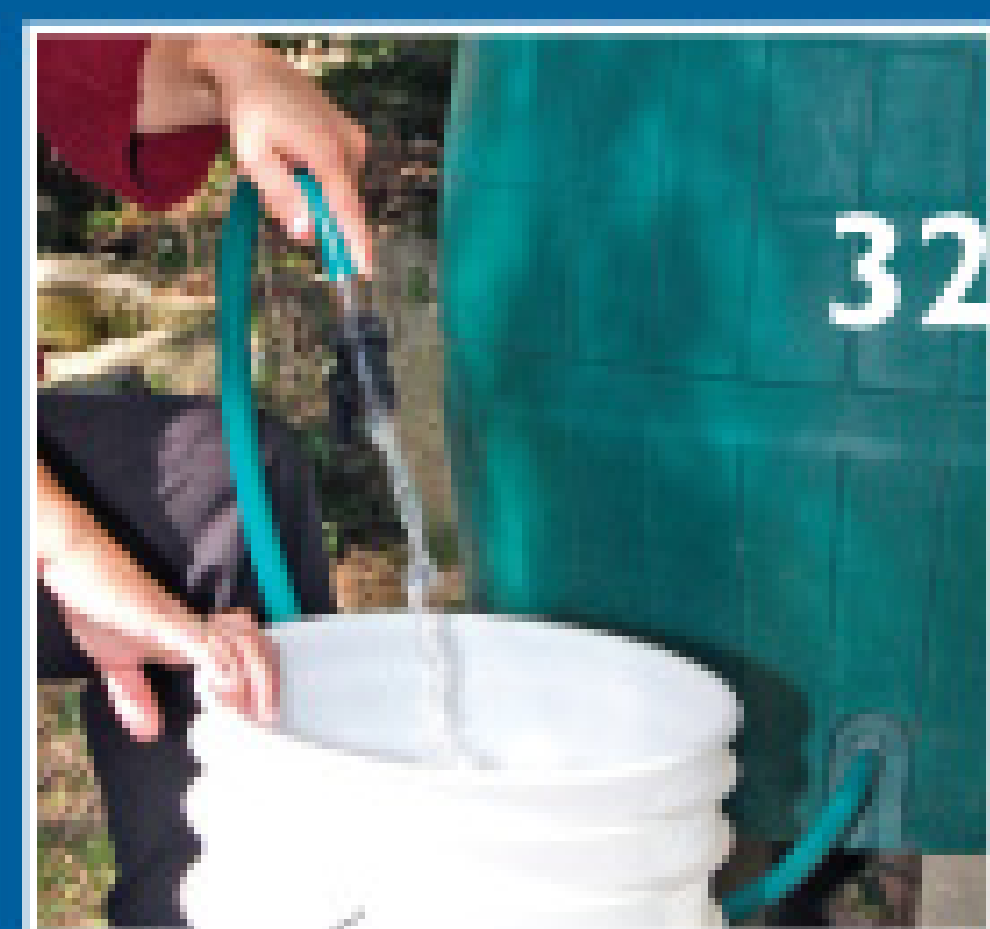
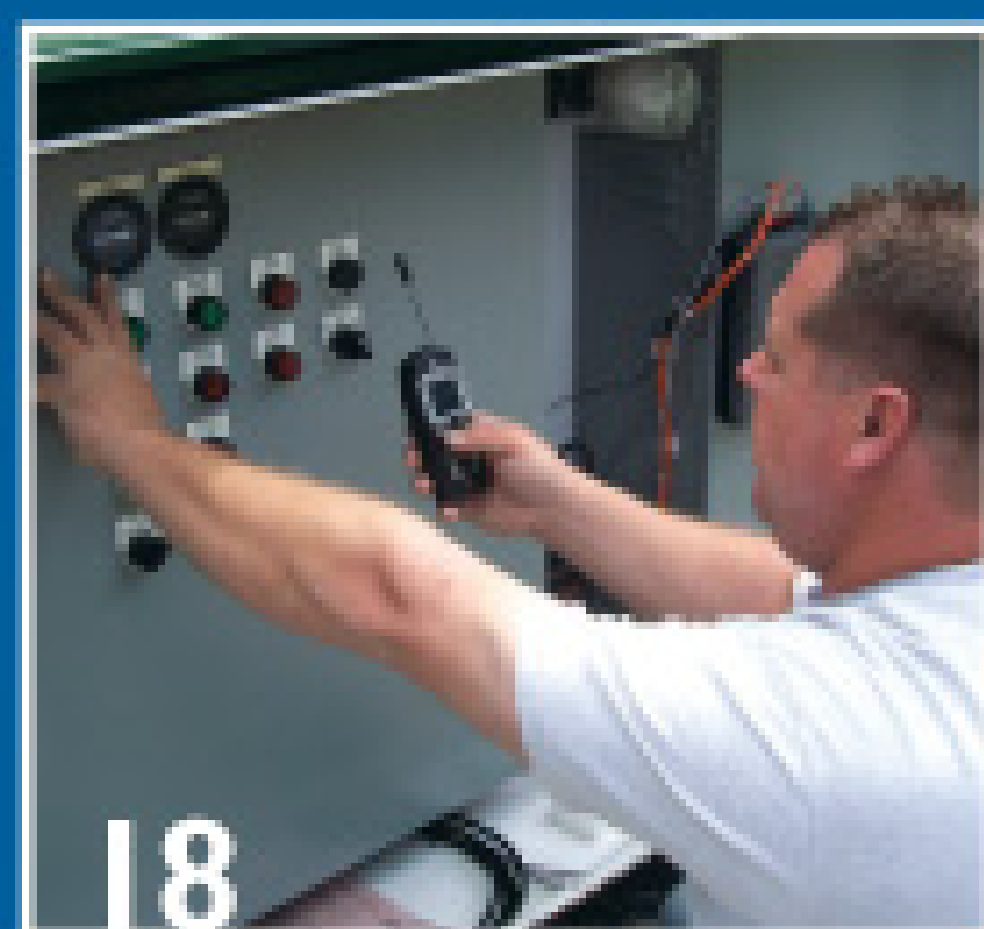


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# INSIDE:

## FIELD AND OFFICE TECHNOLOGY



### COVER:

Gainesville (Fla.) Regional Utilities has elevated GIS to new levels as a practical and versatile asset management tool. Here, Kyle Wheeler (left) and Rodney Dougherty, survey crew members, wait as a robotic total station seeks a signal from an infrared receiver that Dougherty is holding. (Photography by Brad McClenny)



### COMING IN JANUARY 2009

#### Special Issue: Service Vehicles and Equipment

- ◆ Sewer: Exemplary pump maintenance in Salem, Ore.
- ◆ Water: Distribution system rehabilitation in Haines City, Fla.
- ◆ Storm: Infrastructure initiatives in Oakland, Calif.
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DECEMBER 2008

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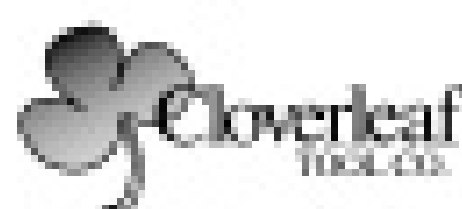
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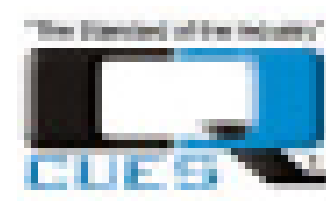
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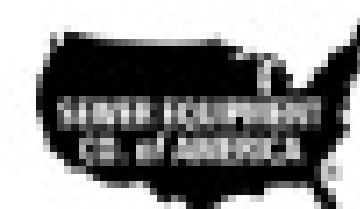
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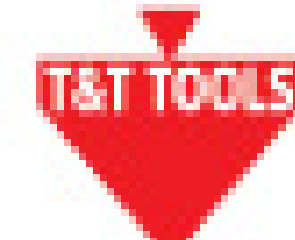
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## MUNICIPAL SEWER & WATER

FOR SANITARY, STORM AND  
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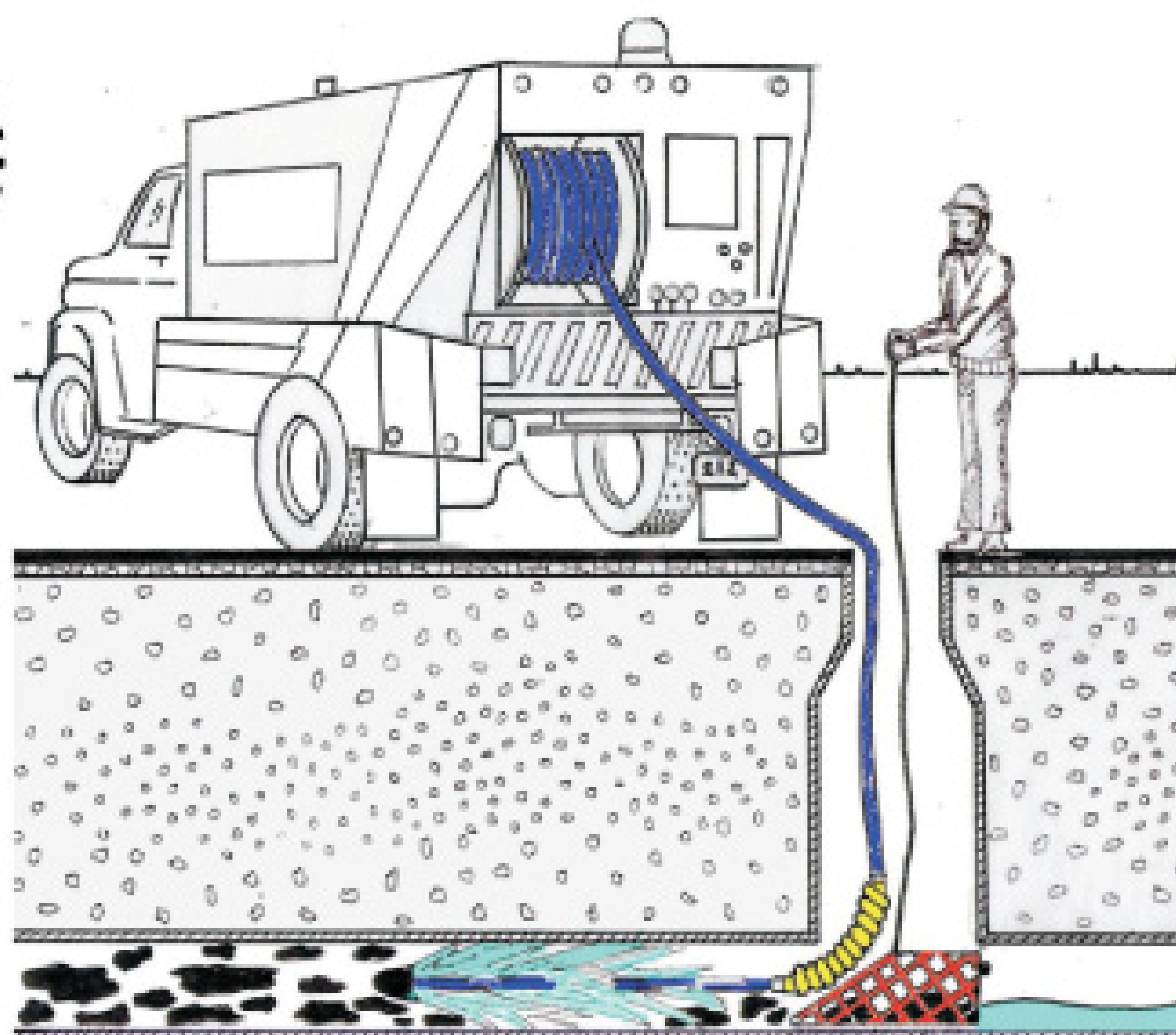
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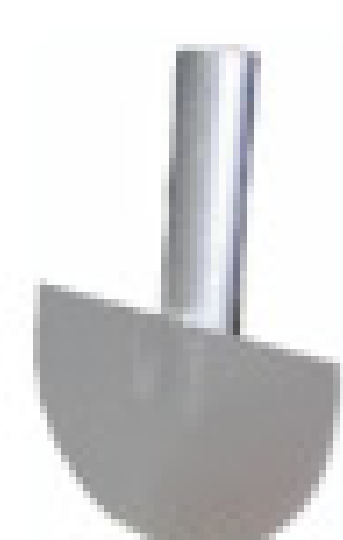
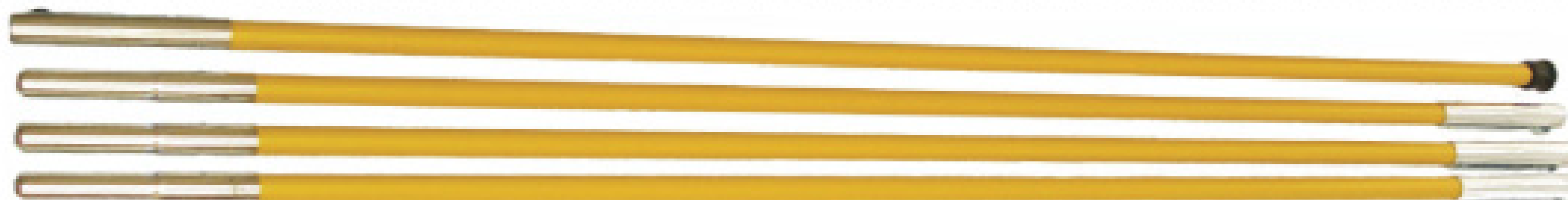
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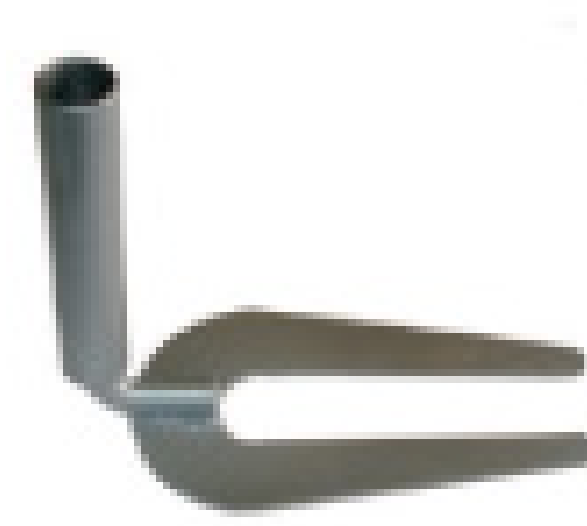
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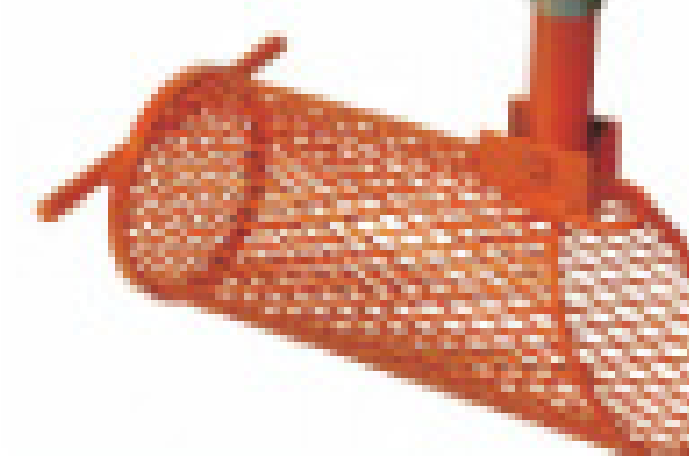
Debris Scoopers Heavy duty construction For 6", 8" and 10" Pipe sizes.



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# WHAT DID THE PAST YEAR TEACH YOU?

Before letting 2008 slip into oblivion, it can be worthwhile to look back and reflect on the year's events and any lessons they may carry

**“Y**esterday it was my birthday. I hung one more year on the line. I should be depressed, my life's a mess, but I'm having a good time.”

**Paul Simon**

I tend to think of that song by Paul Simon, “Have a Good Time,” around birthdays and around year's end. So we're all about to hang one more on the line. But what does that mean? I'm not a big one for New Year's resolutions, but I do believe in going back over the year just passed, not for nostalgia but for the same reason it would pay to go immediately back over notes from a lecture when I was in college, or still pays to review right away the notes from a meeting at work.

Timely reminders are good for the memory banks. What we don't revisit we quickly forget. It's better not to forget things that can teach us worthwhile lessons. (That's why certain books are worth rereading at various stages of life — one such book for me is Dale Carnegie's *How to Win Friends and Influence People*.)

## Making it a tradition

For a number of years my wife and kids and

I made it a ritual on or around New Year's Eve to glance back over the year. My wife would pull out the diary she kept, and we would touch on the notable events — the highlights and the low-lights. It was mostly a pleasant way to revisit and remember our blessings.

I've done something similar to that on a few occasions with my work life. It's not difficult. You just take your planner or whatever you use to record appointments and page on through, front to back or back to front. Odds are you'll encounter reminders of things you did that

**You just take your planner or whatever you use to record appointments and page on through, front to back or back to front. Odds are you'll encounter reminders of things you did that helped make you successful, and mistakes you wish you could take back.**

helped make you successful, and mistakes you wish you could take back. Such items come in all shapes and kinds.

Let's see. Here's a time where I had a nasty flare-up with a colleague. It was so out of character for both of us that on reflection I decided just to erase it from memory as if it never even happened — in much the same way, when compiling statistics, you throw out the one or two figures that simply don't make sense. In the words of a Spanish-speaking acquaintance, *No pasó nada. That didn't happen.* It was a good decision.

Here's a Friday where I had planned a fishing trip, but later put a big



## FROM THE EDITOR

**Ted J. Rulseh**

“X” through the calendar square because I thought I was “too busy.” I should have taken the long weekend: I was a burnout case in the office that Friday. With the break I would have come back refreshed on Monday. Lesson: When you need some free time, take it.

## A lot to learn

How about your calendar? What can it teach you? Growth and wisdom are not just the sum of momentous events. More often they're the slow accumulation of small lessons, the kind that we'll forget if we're not careful, and as they say, when we forget the past, we're doomed to repeat it.

A look back can restore to memory those smaller teachable moments and help us make the learning part of who we are. So, one day before this month expires, consider taking a little quiet time to reflect. Find a comfortable spot, at home or at the office. Grab a coffee. Shut the door. Page through the year, whether on paper or digitally.

Have a notepad with you. Maybe you'll recall a morale-building idea you wanted to roll out, but never did. Or a new technology that you saw demonstrated and never pursued, but that you still think would be helpful. Or a new material supplier you'd wanted to check out. Write it all down and resolve to act on it.

Besides reviewing your own year, maybe it's worthwhile to share the exercise with your team, the way I used to do with my family. It could be a great experience if you keep it light and keep it positive. Who knows what good things your people may remember — ideas you can use that otherwise might have been lost forever.

When you're done, before hanging that year on the line, you'll have wrung all the value from it that you can. ♦

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**7,744 Miles 431 Hours**  
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**10,432 Miles 634 Hours**  
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## More on Maintenance

I appreciated your column on maintenance ("Pay Me Now, or ..." *MSW*, October 2008). It is high time all the infrastructure press paid attention to the Achilles heel of our wonderful country.

It has become a standard political ploy to pretend that everything is fine when maintenance budgets are always the first line item to get deferred or buried. Then, when the inevitable catastrophe occurs, eyes are widened in surprise: "Wow! How could this have happened?"

Our company builds parametric digital models that look at all aspects of an infrastructure project to include not only its design and construction feasibility but also a forward look to determine how the project will meet its goals in the real world. This includes modeling of maintenance and its impact.

At a recent presentation, I

pointed out if you establish a project's goals and ideal structure as being 10 on a 10-point scale, for every single point eliminated at conception you need to increase the maintenance allowance by a factor of 10 for each subsequent year of use. If you don't, the maintenance requirement increases exponentially.

I should not have been stunned when the senior management reaction was, "How can we eliminate the entire maintenance equation from the model?" The truth was far too awkward to handle.

One of the strongest weapons that ignore-maintenance bureaucrats use is the pretense that the real world only exists in a text document format. The real world is what it is, and no amount of obfuscation or paper pushing will change that. If a project has an unrealistic budget and nonexistent

maintenance allocation, or if the properly planned costs and work tasks are cut, in the real world, it will fail, often catastrophically.

The real world has a vicious payback for our budget-led political types, in that it works in the fourth dimension, with time being a cruel taskmaster. This has become so scary that outright computer fraud is being used to hide this problem.

At a university system we were working with, I was curious to see financial managers boasting about superior operational costs when I knew for a fact that they had major problems. On delving into their data I noted very large figures being moved to a "deferred" column by the bean counters with no input from the maintenance personnel.

Then every three years the entire deferred column was deleted from the spreadsheet, and maintenance was asked to recreate it from scratch. When I asked the director of finance about this, he stated bluntly that if an item had been deferred and not used for 36 months and no catastrophe had happened, then it was obviously not needed in the first place. And anyway, if a breakdown of that magnitude occurred, even with loss of life, it would probably be covered under insurance.

In the area where I live, we have major issues with aging infrastructure, especially in water and sewage. The cost to remediate these issues would be in the billions, so a major defensive tactic adopted by city, county and state administration is to include legal liability quotas into the maintenance equation.

Simply, if repair and maintenance of a part of the system would cost \$200 million, the first thing that happens is that a back-of-the-notepad estimate is made of damage to the user. Say a poorly designed and operated sewage system backs up, and damages come close or exceed the repair costs. Then an automatic liability ceiling per instance is installed by legisla-

tion, or, more likely, by regulation (less public visibility).

In our community, that limit is legislated at \$100,000. Note that the limit is not per home, it is per failure event. So even if 100 homeowners incur damages as a result of a sewer backup, tough. They get to share the \$100,000 and have to go fight their own insurance companies for the difference between \$1,000 and the actual cost of repairs.

In fact, a recent sewer backup flooded a street lined with art galleries, damaging millions of dollars of art inventory, and the 20 or so gallery owners get to share \$100,000. And so our trusty civil servants have merely passed the buck back to the citizens who, in the first place, paid for the system and the people who are supposed to take care of it. Heck, why maintain anything when the adverse results are zip?

Maintenance, and I mean real maintenance, needs to become the primary focus of the operation of our entire infrastructure system. If it doesn't, we can look to a brilliant Third World future liberally laced with repeats of the I-35 bridge failure in Minnesota.

You simply cannot manage what you do not measure, and you cannot measure what you do not see. And nearly all of our water and sewage systems live in the unseen world of paper obfuscation. It's time they came out into the open, metaphorically speaking, where they can be maintained properly.

**Peter Baston**  
**IDEAS**  
Santa Fe, N.M.



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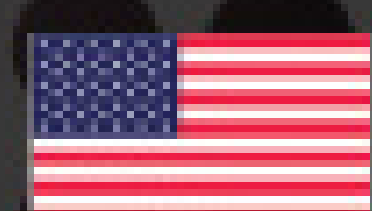
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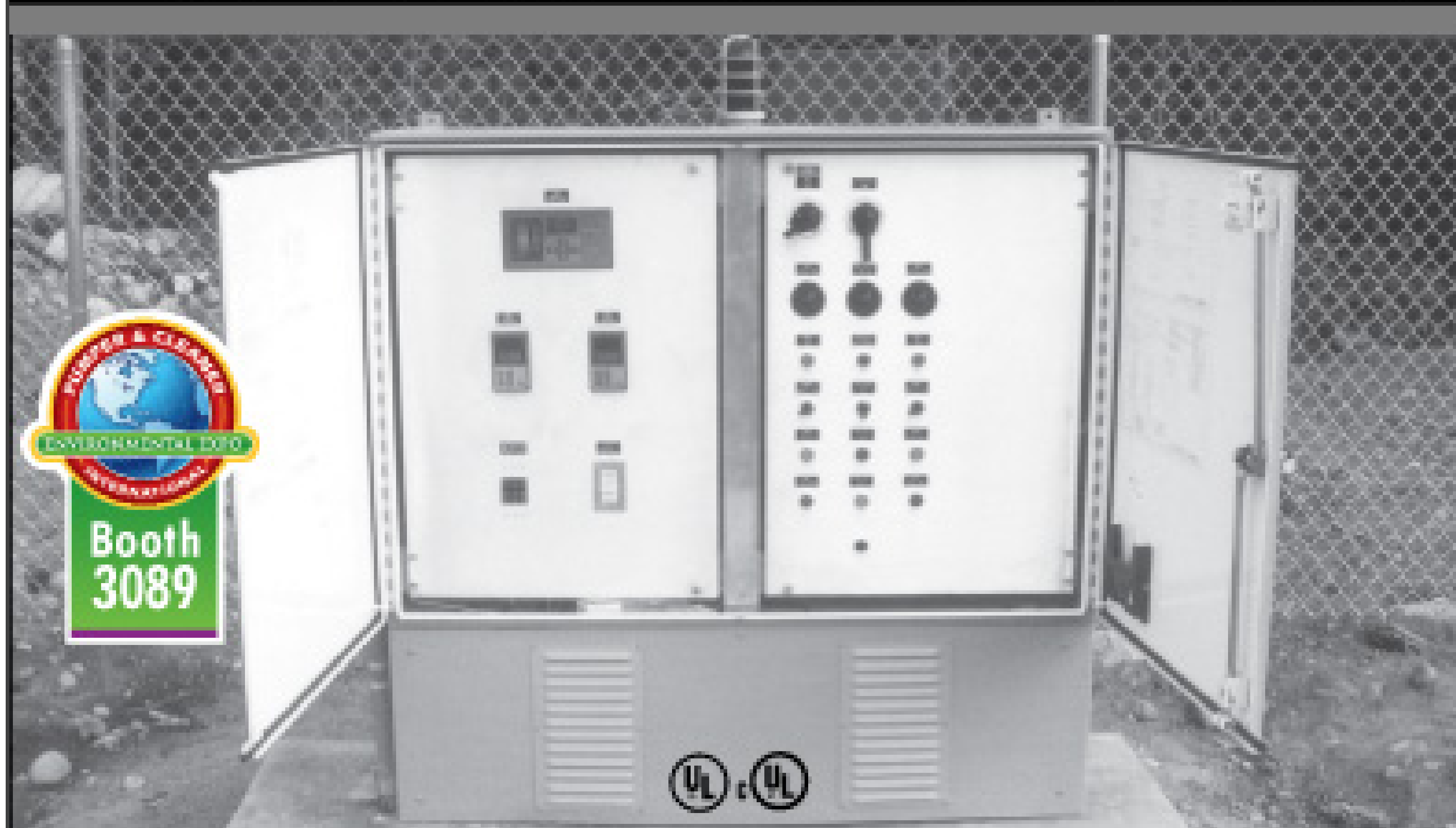
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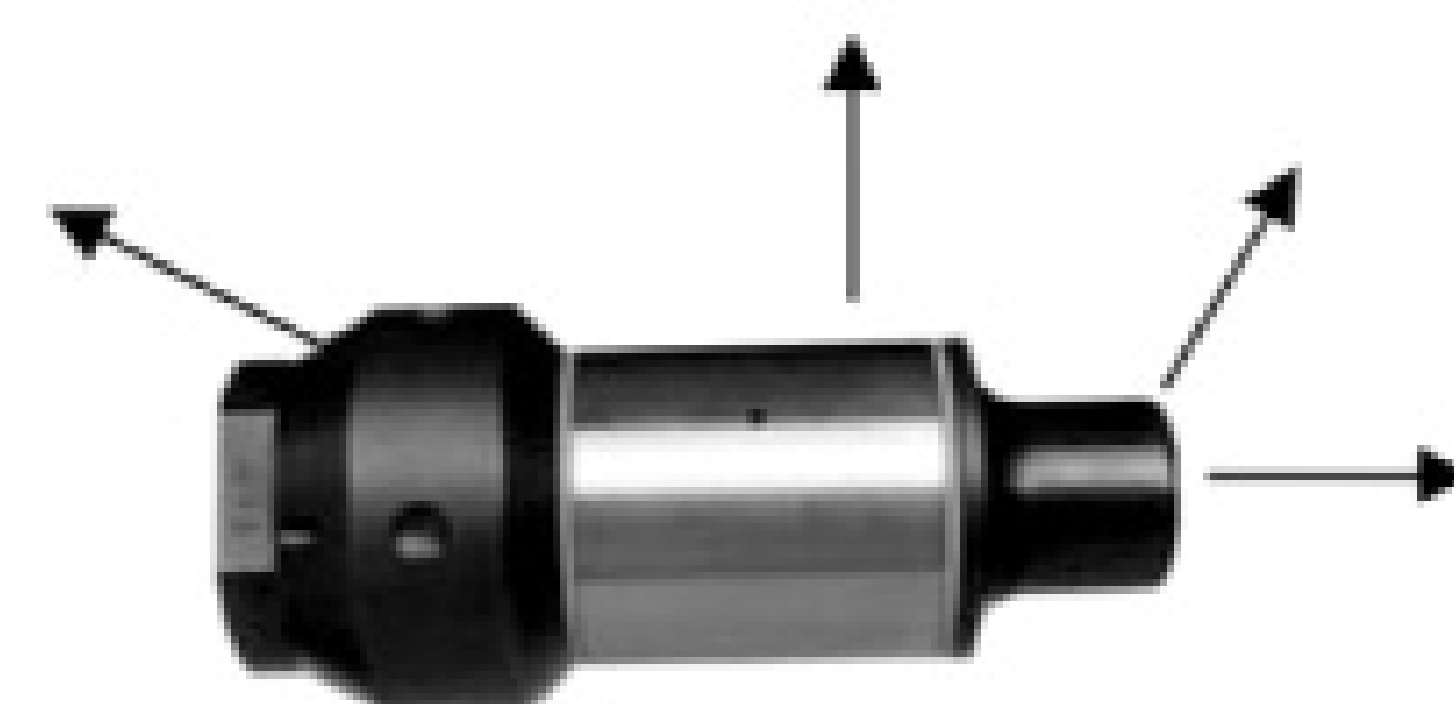
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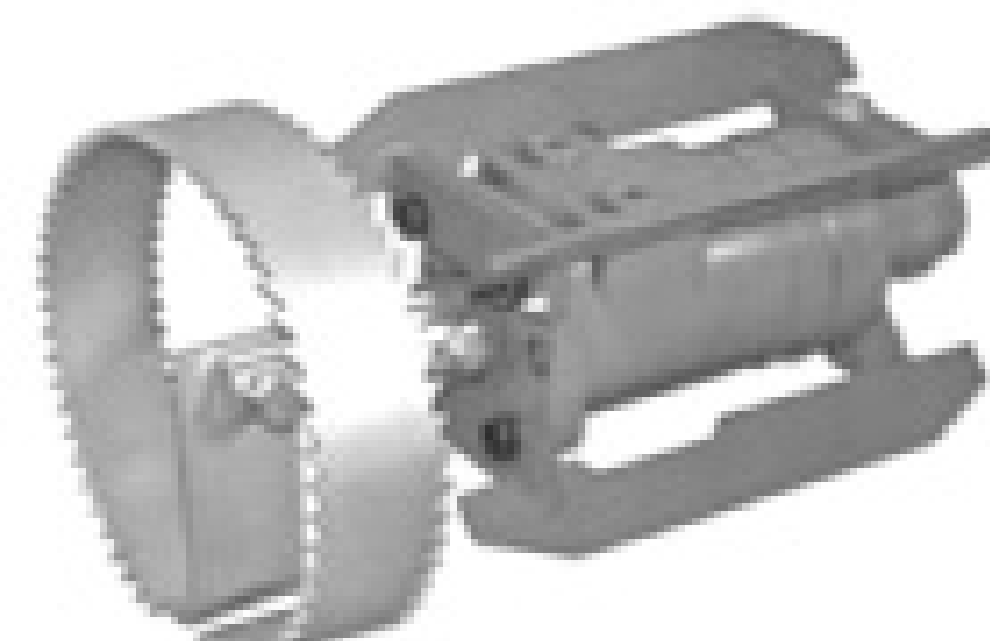
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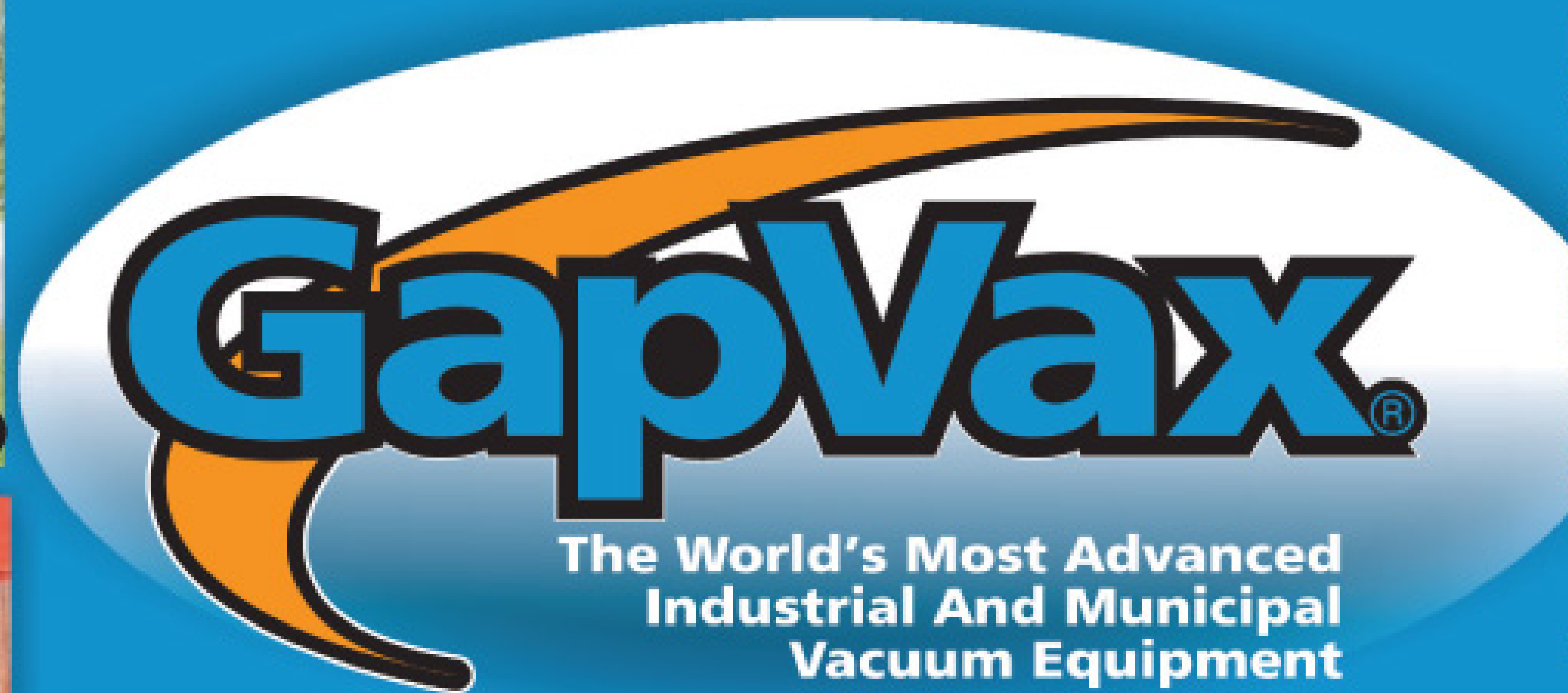
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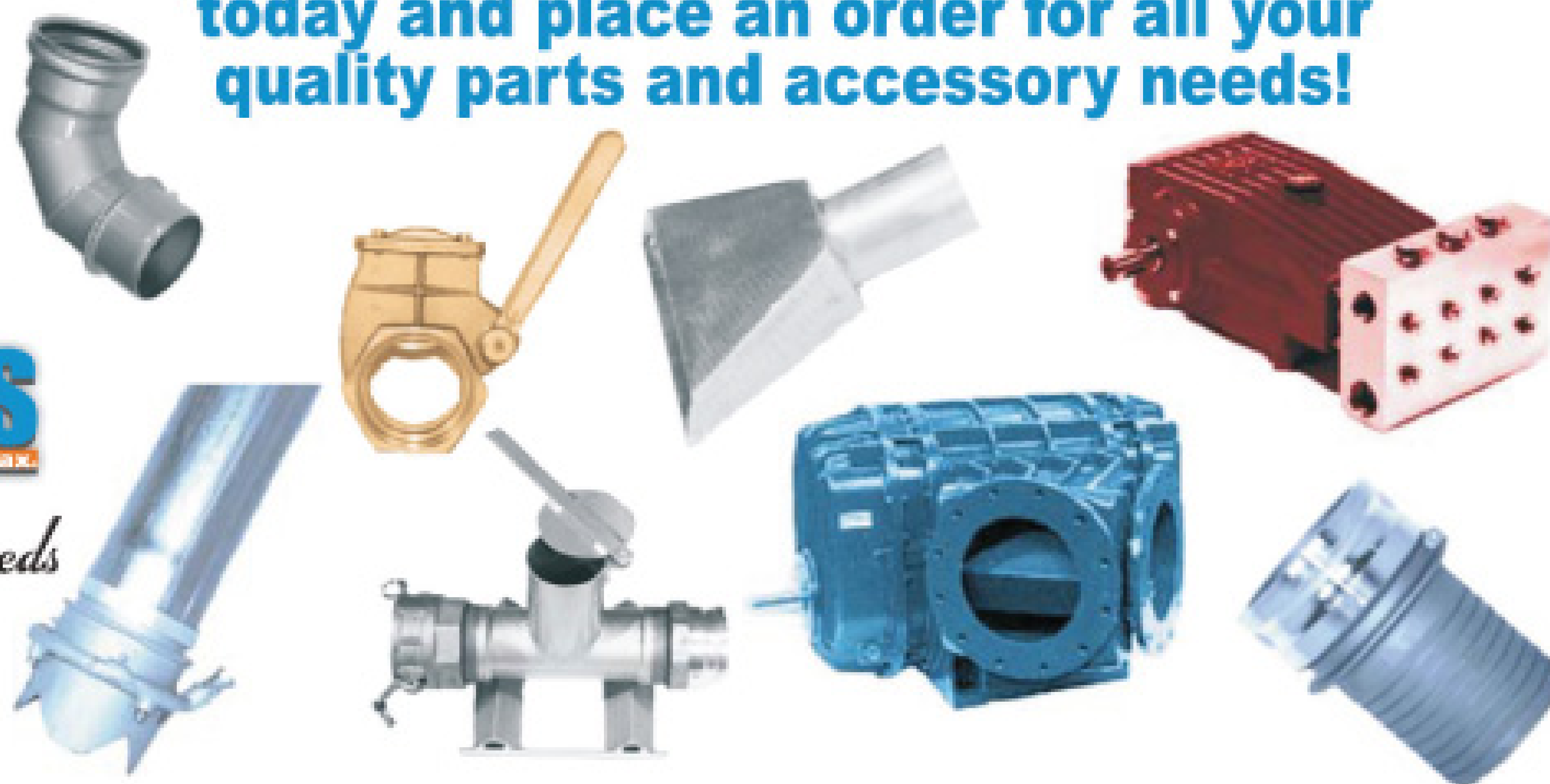
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# GETTING THINGS IN ORDER

A GIS and a data collection system based on cellular telephones help organize operations for water and sewer utilities serving Michigan townships

By Linda A. Day

**T**he Charter Township of Genoa, in south central Michigan, oversees water and sewer operations for a complex network of small utilities. By the mid-2000s, the utilities were in some disarray.

The area, between Detroit and Lansing, has become one of the fastest-growing regions of Michigan. Utility operations were outsourced, and the only oversight was a monthly meeting of the township board with the contractor.

The utilities comprising the

entity known as the Genoa Project include one water authority for the townships of Marion, Howell, Osceola and Genoa, and three sewer systems: the Genoa-Osceola system, and two that are part of Genoa Township.

In 2006, the township hired Greg Tatara as utility director to modernize Genoa Project operations. The township also replaced its outsourcing contractor with Severn Trent Services, a global provider of water and wastewater treatment services based in Fort Washington, Pa.

Tatara and Severn Trent, under project manager Bob Peter, worked together to devise a system for collecting data on the project's lift stations. They also created a geographic information system that tracks every piece of the water and sewer infrastructure. As a result, the township has better control over day-to-day operations and powerful tools to plan for growth.

## Better documentation

Tatara's job was to oversee the

big picture, get the system in shape, and monitor day-to-day operations. He found that much of the equipment was not in proper working order. "Only one of three pumps might be operating in a triplex lift station," he recalls. "Backup generators had not been maintained and some would not start. Replacement parts stocks were almost nonexistent. On the water side, there were lapses in the cross-connection program."

The most pervasive issue, however, was inadequate documentation of equipment location and condition and of lift-station inspections and maintenance. The 57 sewer lift stations were supposed to be checked daily, twice weekly or monthly, depending on location and priority.

"Operators wrote inspection notes in field logbooks on site, but the information was never collated, entered in a computer database, or put into any type of report," says Peter. "There was no way to monitor pumping rates, electrical usage, site conditions or the need for repairs, and no way to verify that equipment checks actually had been made."



## PROFILE:

**Genoa Project,  
Charter Township  
of Genoa, Mich.**

**POPULATION:**  
20,000

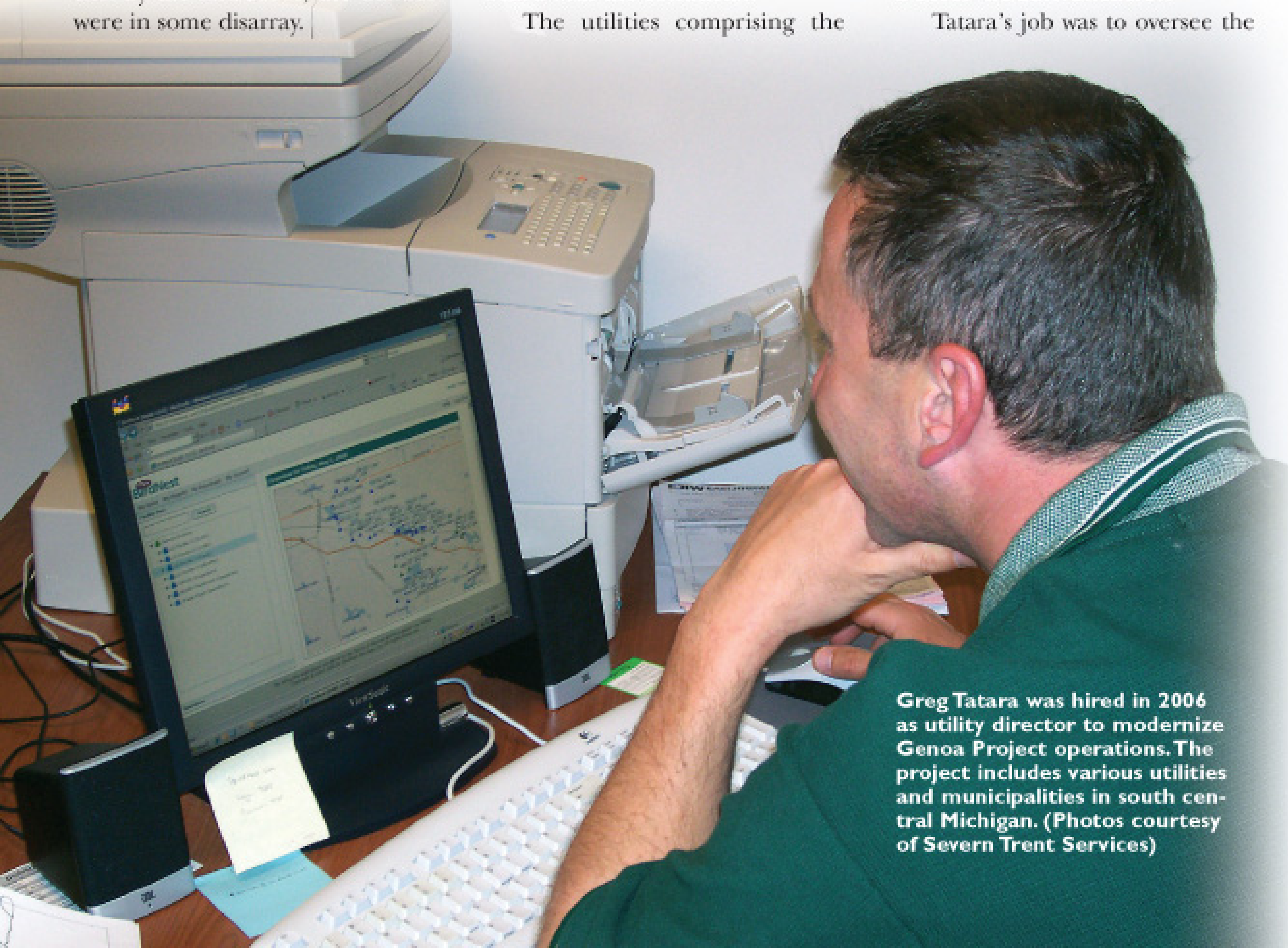
**AREA SERVED:**  
150 square miles

**INFRASTRUCTURE:**  
170 miles of water main;  
150 miles of sewer main;  
57 lift stations

**EMPLOYEES:**  
15 (utilities department)

**WEB SITE:**  
[www.genoa.org](http://www.genoa.org)

Greg Tatara was hired in 2006 as utility director to modernize Genoa Project operations. The project includes various utilities and municipalities in south central Michigan. (Photos courtesy of Severn Trent Services)







**Maintenance technician Duane Chatterson checks readings on a lift station control panel using a Nextel I355 cell phone to record pump run hours. Most of Genoa's wastewater system data is entered via cell phone.**

The poor condition of much of the equipment indicated that maintenance simply had not been done."

#### Getting proactive

Tatara first focused on getting everything working and installing a preventive maintenance program. He then began working on design standards for the system and improving the cross-connection program. He also created an inven-

our operators now use cellular phones to enter lift-station data," Peter says. "The cell phones prompt each licensed operator through a menu customized for each lift station, ensuring that all data is collected."

Once the operator reviews the entries and presses the "send" button, the phone transmits data to a central computing facility, where it is logged and time-stamped. If the

**"The key benefit to the system is the ability to document that jobs are being done and information is being gathered. Managers know critical information, such as when stations were checked, what the pump hours and electrical usages were, and whether the site needs maintenance."**

**Bob Peter**

tory of repair parts for all of the project's water mains, distribution networks and collection pipes and made space for it by cleaning up and reorganizing storage facilities and clearing out types and sizes of piping that were no longer in use.

But the two biggest challenges facing the Genoa Project dealt with information and documentation. Peter implemented an automated data collection system for the lift stations. For that purpose, Severn Trent chose technology offered by BirdNest Services Inc. of Houston, Texas.

"Instead of writing in logbooks,

operator is out of cell tower range, the phone stores the data until it comes within range, then transmits. Data are available to any staff member with a computer and password, sometimes as soon as 15 minutes after collection.

The system includes a report generator that shows tabular and graphed data for whatever categories the user wants to see. Data can also be exported to Excel spreadsheets to produce standard Severn Trent operational and compliance reports. The fee-for-service system includes a one-time setup fee, an annual company access fee,

## BACKUP PROTECTION

Among the benefits of the Township of Genoa's cell phone-based data collection system is protection from liability under Michigan Public Act 222.

Under this law, a municipality found negligent in causing a sewer backup into a home is liable for any damage caused. Many homeowners' insurance policies exclude damage from sewer backups, and those owners often look to the municipality to pay their damages when their insurance claims are denied.

Courts have ruled that the municipality is negligent only if four tests are met:

- Was there a defect in the municipality's sewer line?
- Did the municipality know, or should it have reasonably known, about the defect?
- Did the municipality fail to correct the defect within a reasonable time after learning of it?
- Did that failure cause both the event and damages?

If the municipality exercises reasonable care in inspecting and maintaining its sewer lines, and if it responds to problems in a reasonable manner and time, it is not liable when sewer backups occur. The township's data collection system documents that the Genoa Project is performing due diligence in maintaining its system and in detecting and responding to defects.

and a monthly subscriber fee based on the number of users who put data into the system.

#### Comprehensive tracking

Although the township runs two SCADA systems at nine lift stations, Peter uses the cell phone system at those sites because they still need to be physically checked. "A lot can go wrong that does not show up on a SCADA screen," he says. "The cell phone system lets operators track issues such as vandalism, rodent damage, insect infestations or even the fact that the grass needs mowing."

To prepare for the system, Peter collected data such as the operators' routes, the pumps and their nameplate information, the type of float system, and whether a backup generator was on site. It then took about two weeks for BirdNest to build the cell phone menus. To train operators, BirdNest ran remote seminars using a Severn Trent computer projection system.

The system proved effective for monitoring lift stations, and Peter expanded it to track backup generators to make sure they were exercised on schedule. He is now expanding the system further to include water treatment booster stations (to monitor chlorine injec-



**Maintenance supervisor Scott Kelosky (left) and Chatterson check a wet well. Their observations help track equipment and maintenance issues, all via cell phone technology.**

tion), and the project's three wastewater and two water treatment plants.

Peter also uses the system to monitor the Severn Trent truck fleet. On a weekly basis, operators

enter their mileage, tire condition and fluid levels as a safety check.

"The key benefit to the system is the ability to document that jobs are being done and information is being gathered," Peter says. "Managers know critical information, such as when stations were checked, what the pump hours

and electrical usages were, and whether the site needs maintenance. Everything is available on a daily, weekly or monthly basis, and it's available almost in real time."

### Multiple benefits

Report data are visible to all who need to know. In one case, when electrical usage at a lift station began trending upward, Tataara was able to get the information and create graphs to show the sewer authority that it would be more cost-effective to replace the pump than to pay for the electricity.

Finally, Peter and Tataara see potential to use the data collected to model infrastructure for future capital improvements. Tataara and his staff have completed a hydraulic model charting the next 20 years of growth in the water distribution system and projecting the infrastructure improve-

ments that growth will require.

Tataara plans to model the sewer system next. Some of the system is almost 20 years old, and a capacity and condition analysis is on the drawing board. When the sewer model is built, the BirdNest data will provide accurate information on flows and rainfall.

The township already has a line item for infrastructure capital expenses in the budget, so when

clicking on the pipe brings up the plan sheets for that pipe. Full construction plans are also available online.

The ArcView database resides on the hard drive of the laptop, and it is updated quarterly. As wireless service becomes available in the area, the project plans to convert to real-time access.

At present, only the water and sewer infrastructure is loaded into



Project supervisor Bob Peter uses the town's BirdNest system to review data that was collected via cell phone in the field.

**"I feel privileged to work in a township like Genoa, where the leadership sees the advantages that can be gained by new information applications. We are fortunate to be doing applications that many other utilities are still dreaming about."**

Greg Tataara

new facilities are required, it won't be necessary to go back to the ratepayers for construction funds.

### GIS tracking

Tataara's GIS project has already captured a vast amount of information, which ultimately will be available on a township Web site. He uses the ArcMap, part of the ESRI ArcGIS, with a Trimble Geo XH GPS unit for recording data in the field.

"Data collection can be extremely detailed," Tataara says. "For example, for a single fire hydrant, the system can track the type of hydrant, its manufacturer, the year installed, the nearest address, the type of fitting and its condition, the condition of the isolation valve and its location, and the size of the connection to the main."

Altogether, the system includes tens of thousands of data points for virtually every part of the infrastructure. GPS capability helps locate facilities quickly even when the ground is snow-covered. Last winter, local fire departments started using the GPS in addition to their own maps to locate hydrants.

Severn Trent maintenance crews use the system on every job. The GIS data, including construction drawings and diagrams, is downloaded to Miss Dig, a laptop system carried by each crew supervisor. Using ArcView, the supervisor can check locations in the truck without having to rely on maps. Clicking on an address brings up the pipe nearby, and

the GIS. Ultimately the township may have a comprehensive system that includes all utilities: water, sewer, gas, electric, telephone and cable.

### Leading edge

"Bob and I feel privileged to work in a township like Genoa, where the leadership sees the advantages that can be gained by new information applications," Tataara says.

"The BirdNest system gives us documentation that promotes good management of the system for a price that might be considered a drop in the bucket of utility operations," he says. "And the ArcMap/ArcView GIS system speeds repairs and helps make sure that the right parts are always available and that the correct repairs are carried out."

"We are fortunate to be doing applications that many other utilities are still dreaming about." ♦

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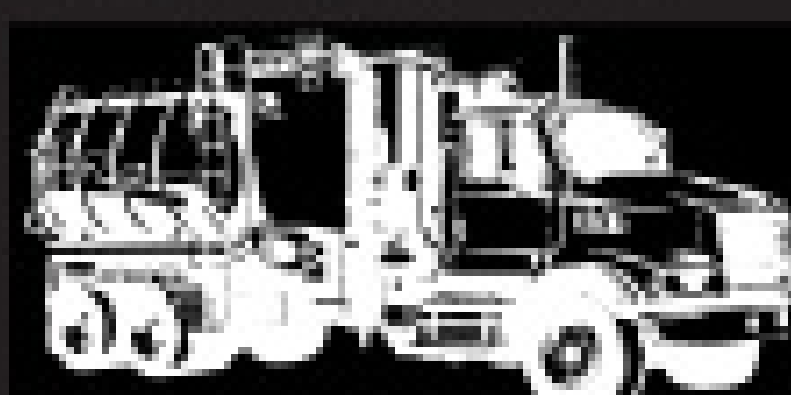
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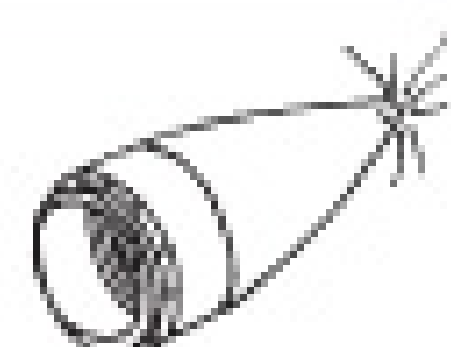
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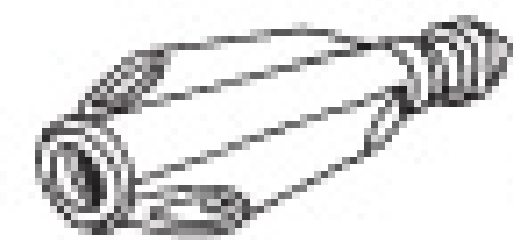
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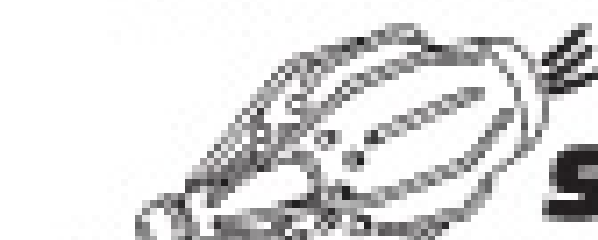
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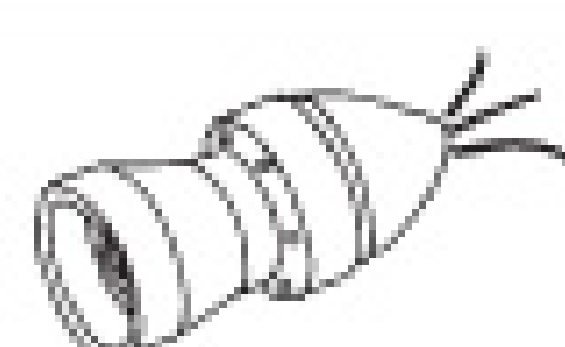
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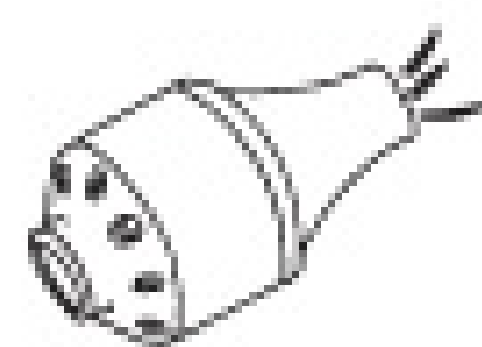
1" \$480.00

1" Big Shark \$595.00



### Radial Bullet

3/4"-18° or 35°	\$50.00
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1"-18° or 30°	\$66.00
1"-15° or 30°	\$68.00
1-1/4"-18 or 35°	\$85.00

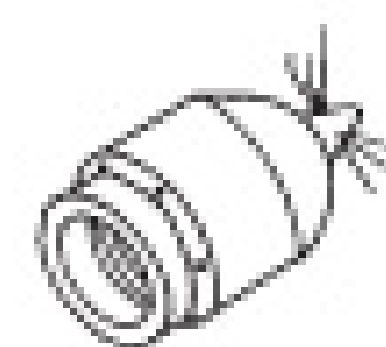


### Aluminum Sand

3/4"-24°	\$139.00
1"-17°/24°	\$153.00
1"-24°	\$139.00

### Stainless Steel Nozzles

1/8"	\$30.00
1/4"	\$33.00
3/8"	\$39.00
1/2"	\$54.00
3/4"	\$59.00
1"	\$105.00

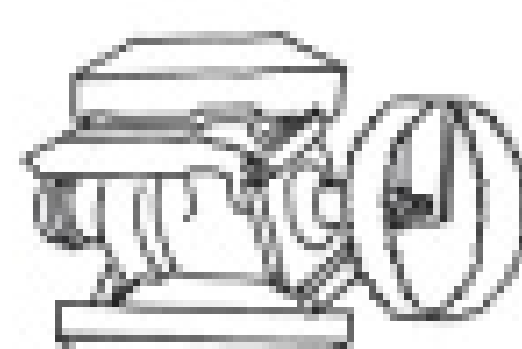


### Steel Sand

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w/concave blades	\$889.00
w/spiral blades	\$889.00
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w/concave blades	\$889.00
w/spiral blades	\$889.00
<b>Lateral Mounted</b>	
w/flat blades	\$825.00
w/concave blades	\$895.00
Assemblies come with one ea. of 6, 8, 10 and 12" blades, saw blades, hub, skids, etc.	

### Sewer Hose Guides

#### TigerTail™ Style

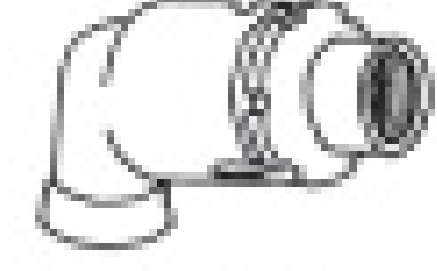
3" x 36"	\$42.00
2" x 36"	\$34.00

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3"-6" available	

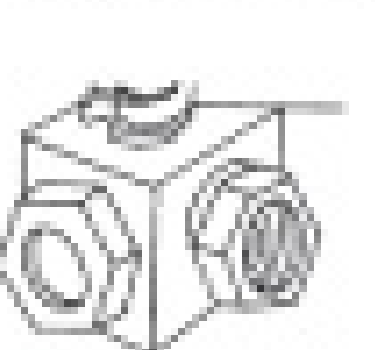


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1-1/2"	\$453.00
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1-1/4"	\$243.00



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1" 2-way	\$119.00
1-1/4" 2-way	\$226.00
4500 psi	
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1/2" 3-way	\$160.00
3/4" 3-way	\$180.00
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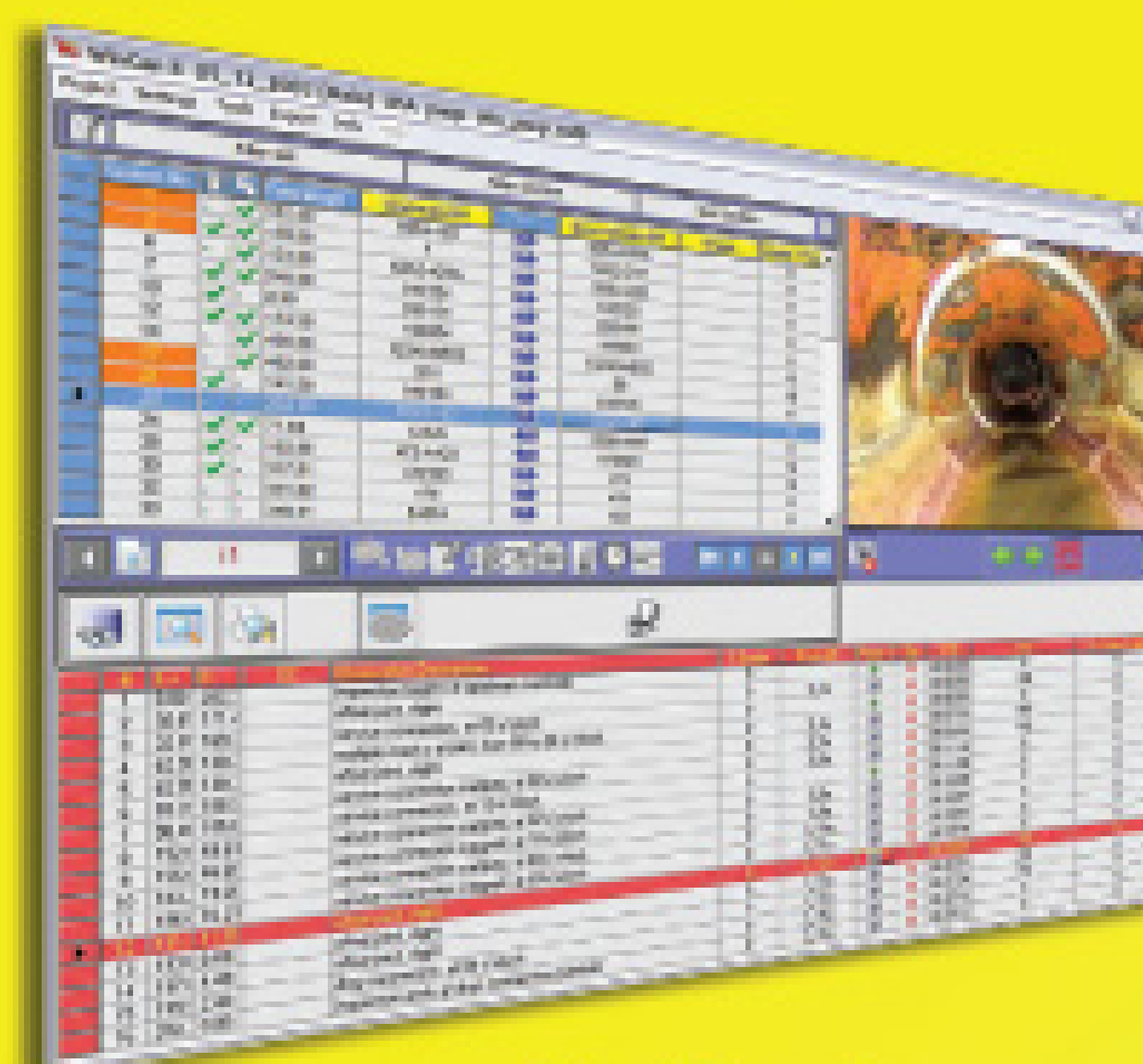
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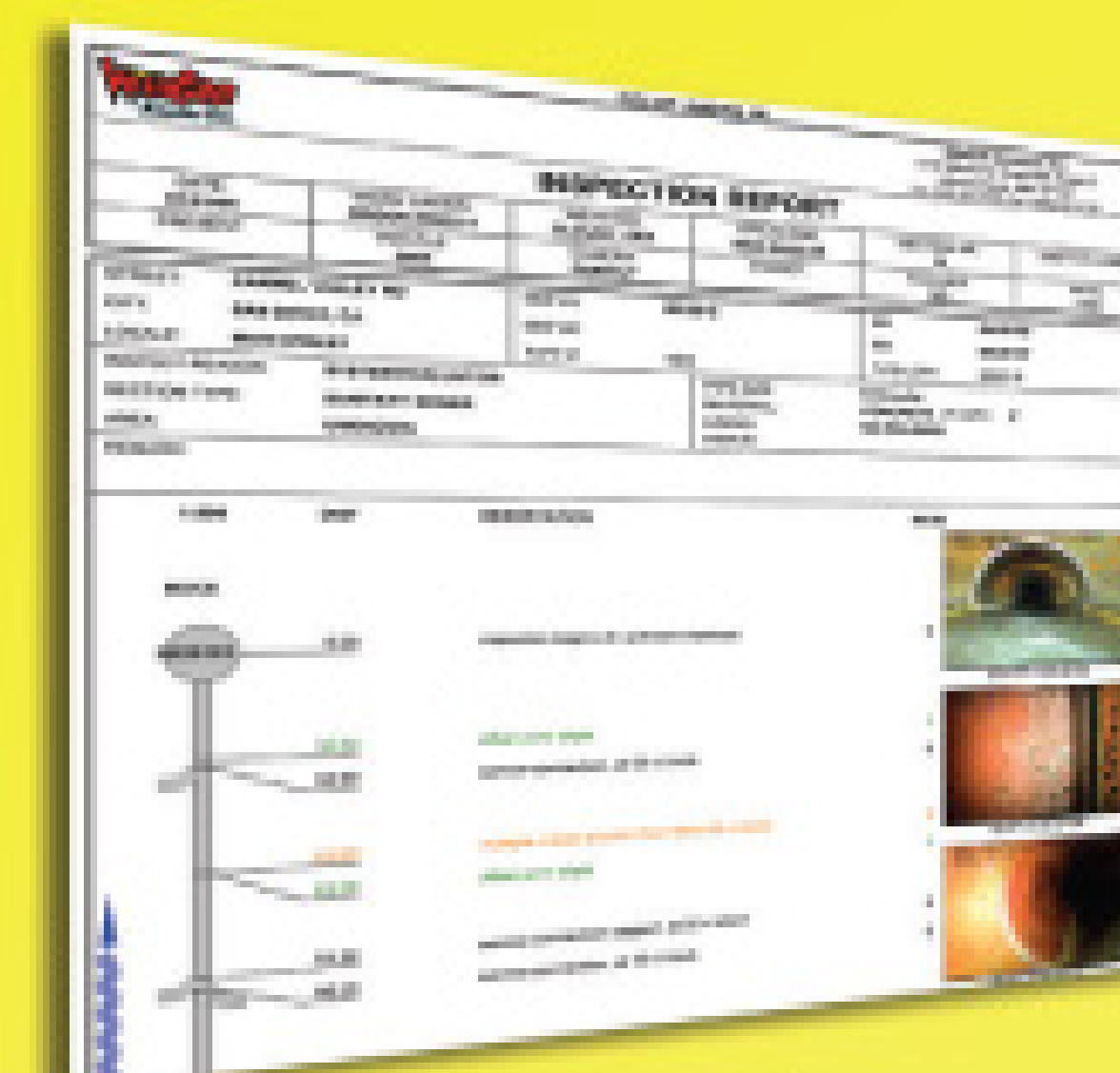
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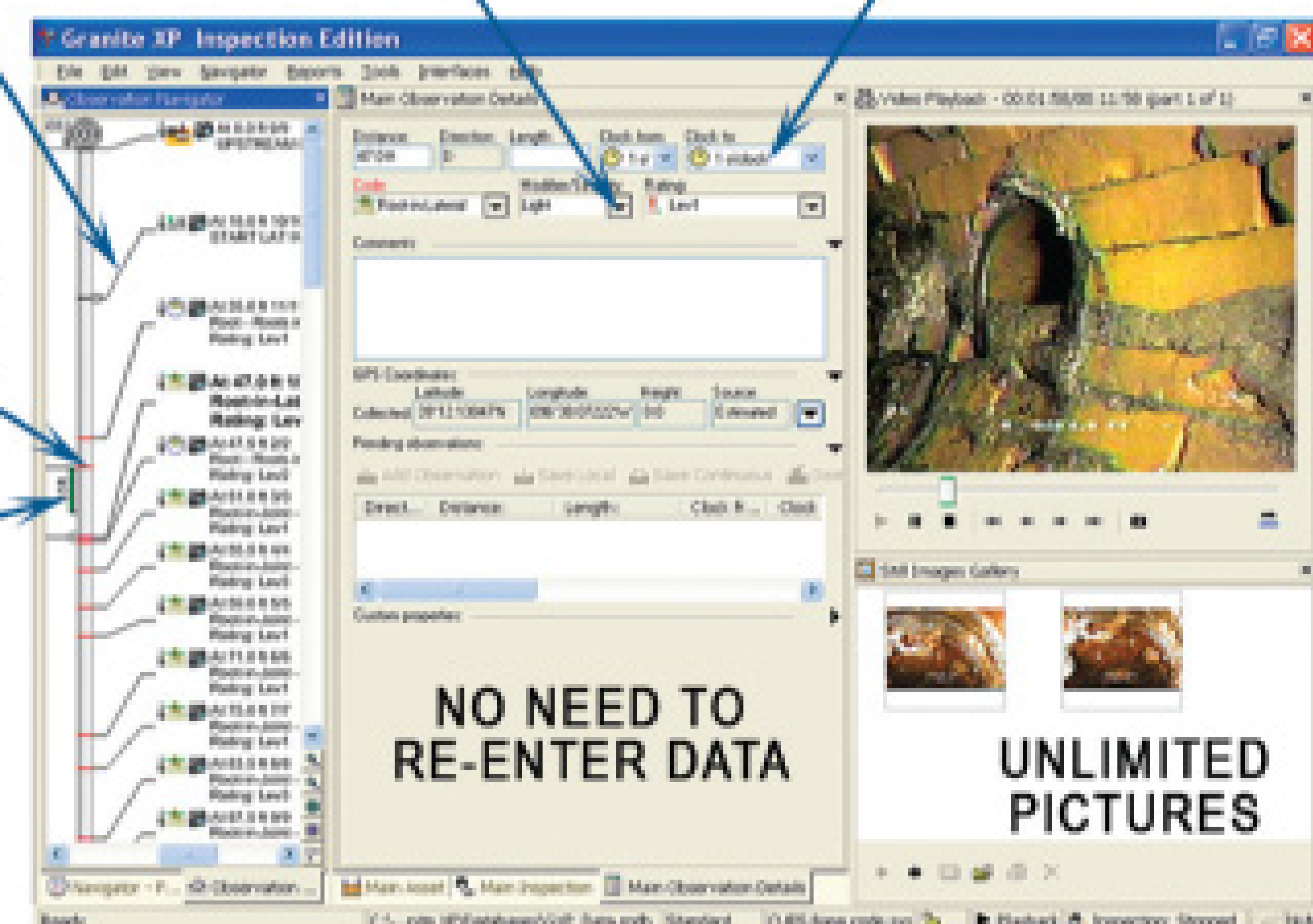
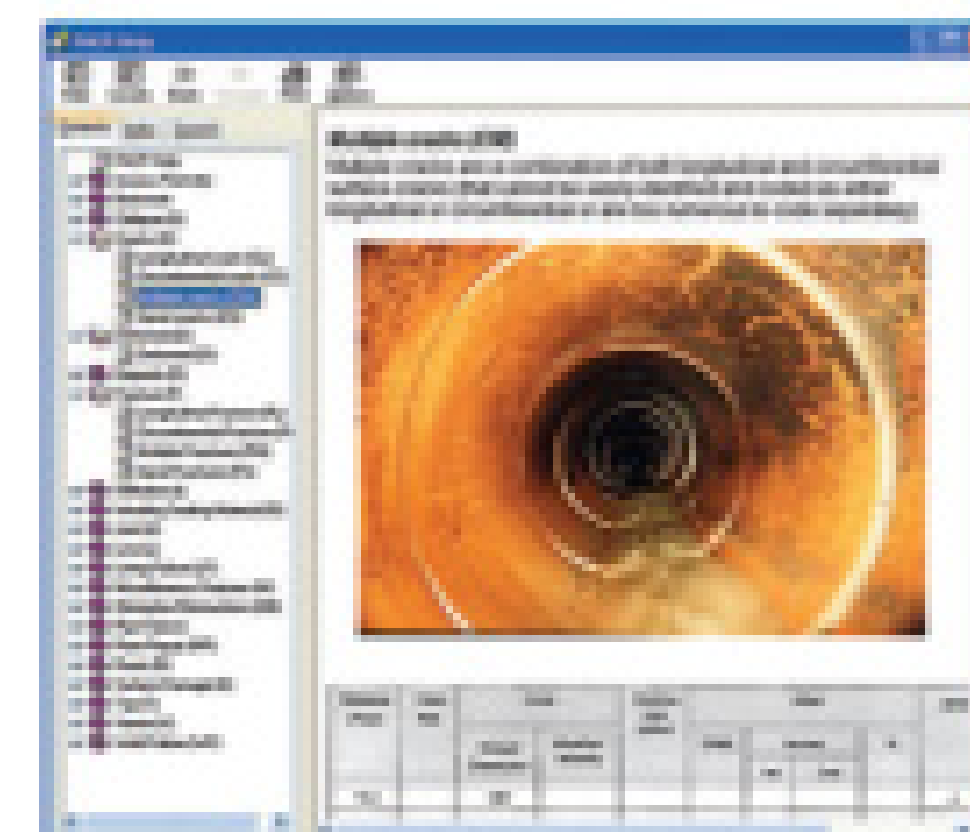
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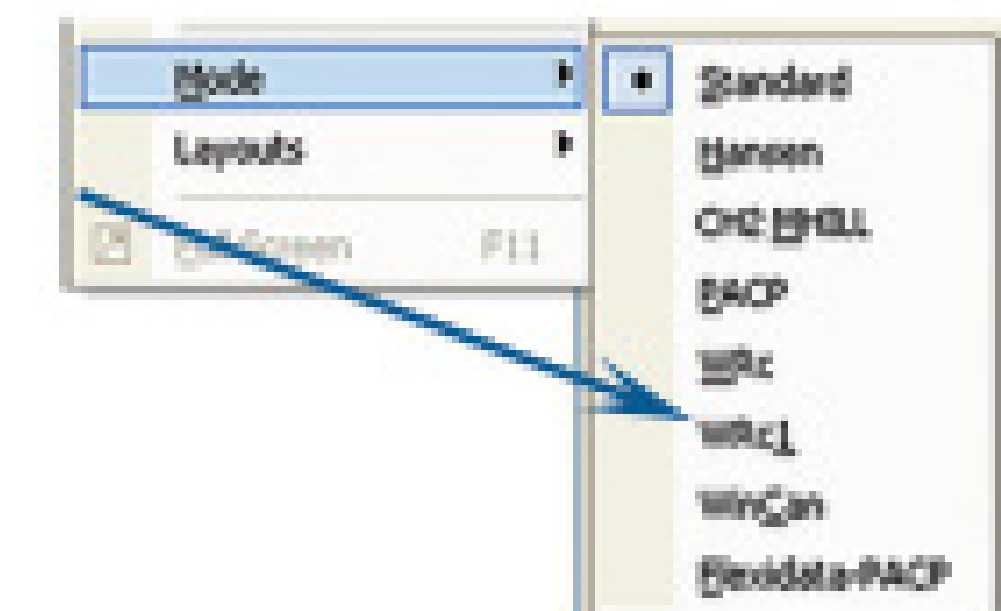
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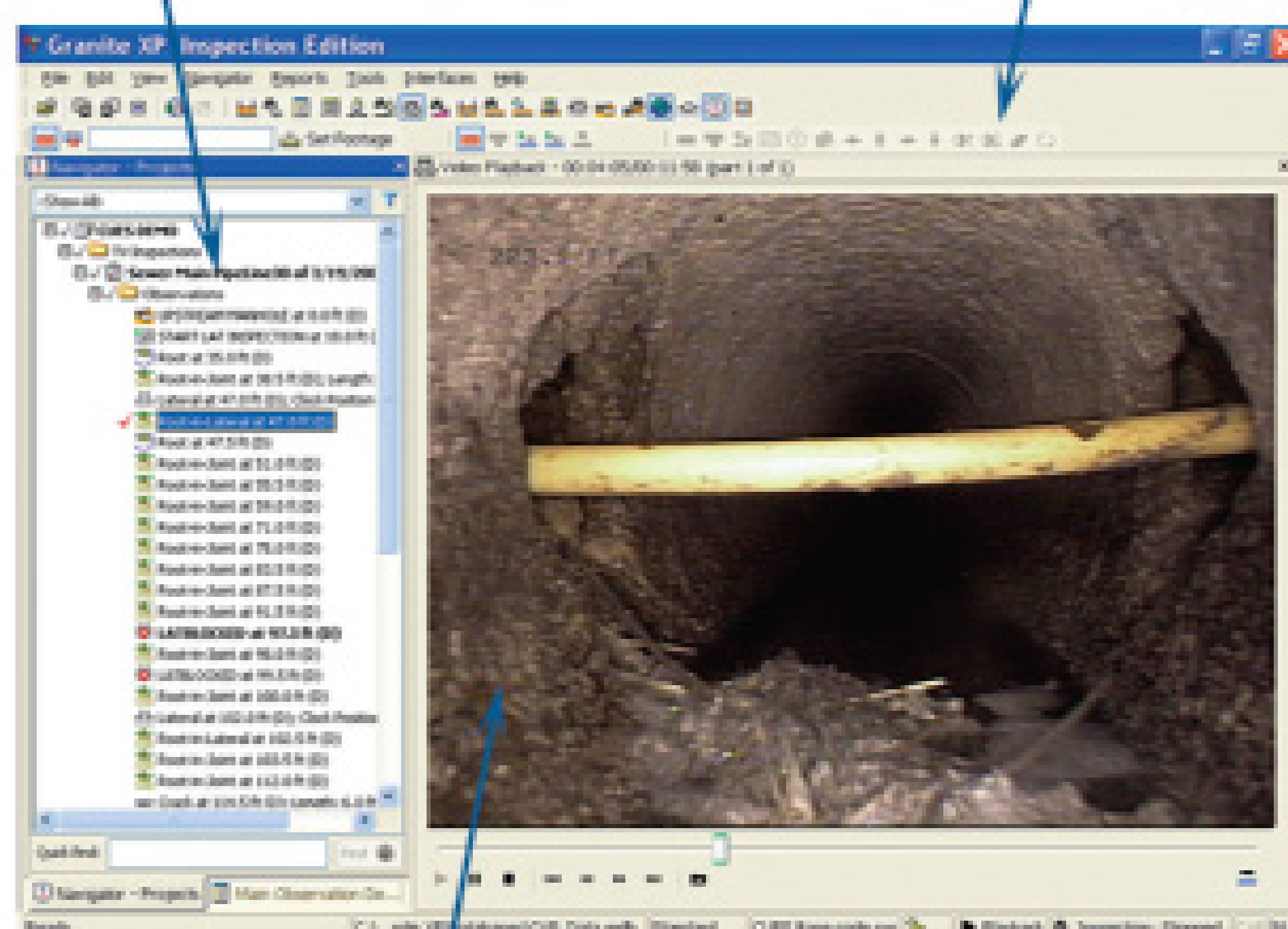


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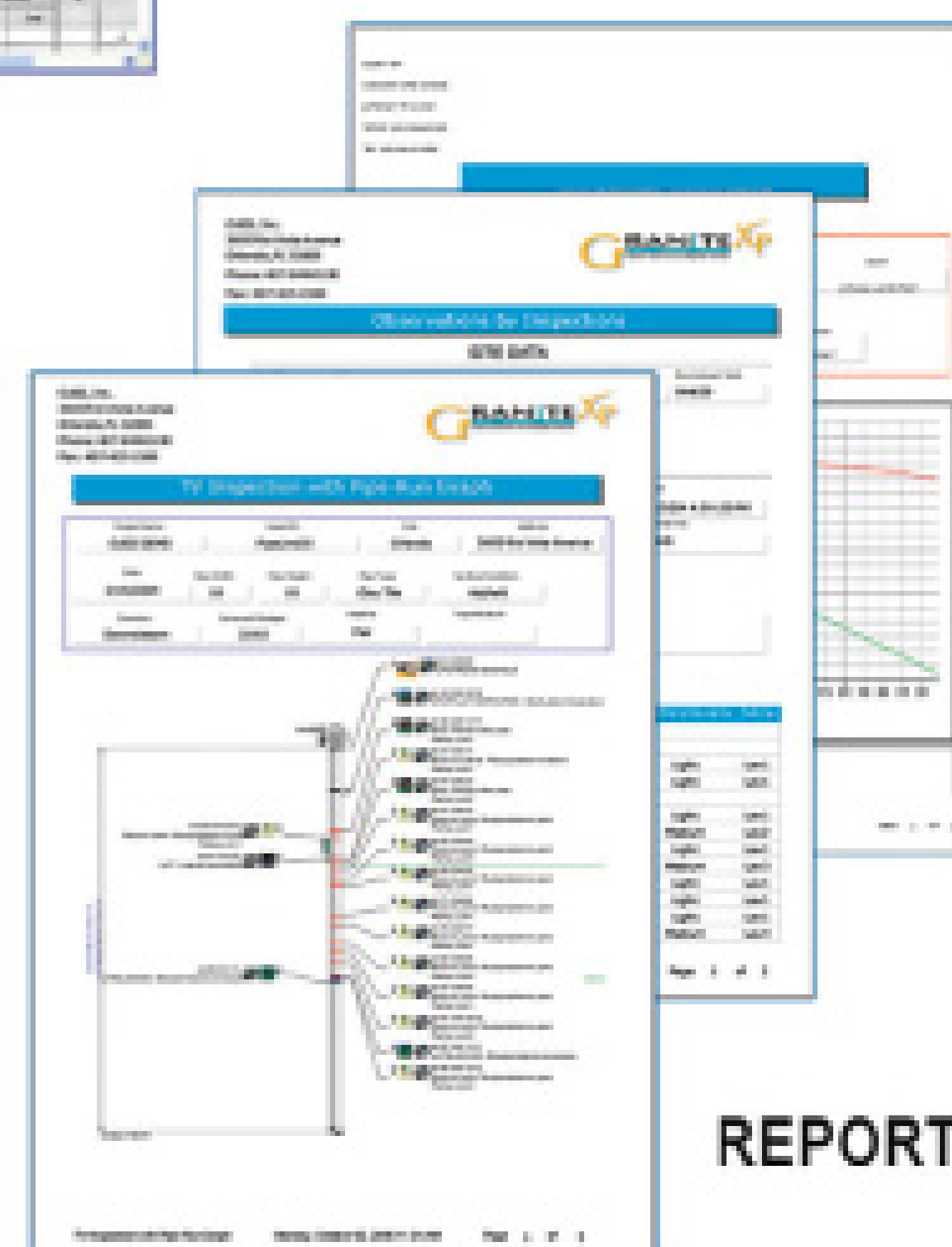


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Education Day at the 2009 Pumper & Cleaner Expo includes tracks of seminars tailored specifically for municipal pipe maintenance and repair professionals.

# THE EDUCATION EDGE

Seminars during the 2009 Pumper & Cleaner Expo focus on pipe cleaning and repair, regulations, rehabilitation technologies and other vital topics

By *Scottie Dayton*

A track of seminars presented by the Southern Section Collection Systems Committee (SSCSC) highlights the education lineup at the 2009 Pumper & Cleaner Environmental Expo International, Feb. 25-28, in Louisville, Ky.

The SSCSC program is part of Education Day on Wednesday, Feb. 25. The complete program includes 46 seminars presented by industry experts across the full range of environmental service industries. Seminars are also offered on Thursday and Friday mornings. A summary of the SSCSC program follows. For a complete seminar schedule, see the Expo pages in this issue of MSW.

## **Trenchless Pipe Rehabilitation: Pipeline Problems and an Overview of Trenchless Lining Solutions**

**Dave Badgley, consultant for Sancon Engineering Pipeline Rehabilitation Division and RedZone Robotics Pipeline Condition Assessment Services**

Sewers are the wastewater utilities' largest investment. Trenchless technologies offer alternatives to digging up and replacing lines. Besides looking at the history of trenchless rehabilitation, Badgley will describe the main causes

that make it necessary: infiltration, exfiltration, roots, corrosion and structural defects.

His seminar looks at traditional dig-and-replace, cured-in-place pipe liners, fold-and-form liners, and continuous, sectional and spiral-wound slip liners. Badgley will explain where each application is most beneficial, and its advantages and disadvantages in different situations.

## **Pipeline Inspections: Getting the Most Out of the CCTV Operator Position**

**Jim Aanderud, president, Innerline Engineering**

Raising the competence level of CCTV pipeline inspection operators is a key goal for municipal supervisors and operations managers. Aanderud's seminar will provide a practical guide that elevates proficiency levels, improves quality and increases productivity. "I will motivate and challenge existing operators, and encourage and inspire new and upcoming ones," he says. "Everyone will leave with a better understanding of how to achieve a quality CCTV pipeline inspection program."

## **Nuts and Bolts of GIS**

**Mark Hill, project manager, RBF Consulting**

A geographic information system (GIS) is basically a map-making program. Taken beyond that, it is one of the most powerful tools managers, workers or planners can have in their tool chest.

Hill's presentation will take the mystery out of GIS by showing what makes it tick. His session will cover basic components, then review some frequently used functions, such as planning the most efficient routes for pickups and deliveries, providing location notes, entering maintenance information, tracking work order history, and more.

## **Nitty-Gritty on Pipeline Cleaning**

**Duane Johnson, vice president, Affordable Pipeline Services**

Combination trucks can do only so much: Operators clean the pipe. Johnson will describe some common misconceptions of how flow rate and pressure affect cleaning, what nozzles to use for specific applications, proven cleaning techniques, tricks of the trade, and how to use cleaning equipment to its full capability.

## **Conforming to Confined Space and Personal Protective Equipment Safety**



### Requirements in Wastewater Collections

**Rick Lewis, OSHA-certified outreach program trainer**

Understanding new OSHA regulations on personal protective equipment is an intimidating task for most and ignored by many. Lewis will give an overview of regulations for confined-space entries and personal protective equipment. He will also explain what records to keep and how to set up and document training programs. His seminar also will cover confined-space entry hazards and procedures, and different gas monitors and how to use them.

### Manhole Inspections, the Sometimes Forgotten Link in Collections Systems

**Denis Pollak, founding member,**

**California Water Environment Association SSCSC**

Sewers have a replacement value greater than those of wastewater treatment plants. Municipalities spend up to \$90 billion per year replacing pipelines and manholes, often using trenchless technologies. "Manholes are often seen as the forgotten link in our collections systems," says Pollak. "I will explain why they are necessary, the need for inspections and various methods, and what to do with the data."

His seminar will look at infiltration, exfiltration, roots and structural defects, then cover rehabilitation technologies such as spray coatings, grouts, fiberglass-reinforced cured-in-place

liners, and PVC mastic liners. Pollak also will review manhole construction and how to improve it.

The Education Day lineup also includes a track of seminars from the National Association of Sewer Service Contractors (NASSCO). Those programs are:

- Robotics for the Future: What Do They Mean for You? – Scott Thayer
- Small-Diameter Epoxy Coatings: How to Rehab 1/2- to 2-Inch Lines – Brian LeMaire
- Root Control: How Does It Work and Why Is It Needed? – John Fletcher
- OSHA Regulations Need Understanding – Kathy Romans
- Choosing the Correct Chemical Grouts for Municipal Applications – Ed Paradis
- Trained Technology Inspectors: How Can They Ensure a Better Job for the Customer and Higher Profits for the Contractor? – Gerry Muenchmeyer

Here are several other presentations of interest to sanitary storm and water system maintenance professionals and engineers:

### Wednesday, Feb. 25 (Education Day)

- Cross Bores of Gas Lines in Sewers:

Reducing Risk of Injury and Damage – Mark Bruce, Cross Bore Safety Association

### Thursday, Feb. 26

- Why Measure Sewer Flows from Private Services? – Kirk Nivens, City Meter
- Polymer Solutions for Water and Wastewater Treatment – Ed Winn, Fort Bend Services
- A Study of Rotary Jets for Material Removal – D. Wright, J. Wolgamott, G. Zink, StoneAge Inc.

### Friday, Feb. 27

- Eliminating SSOs with Chemical Root Control – Bill Fuller, Douglas Products
- Keys to Proper Power Take-Off Selection – David Douglass, Muncie Power Products Inc.
- Lateral Replacement Program: Municipal Perspective – Collins Orton, TT Technologies Inc.

To find out more about the education program or any other Expo offering, visit [www.pumpershow.com](http://www.pumpershow.com). Register online or by calling 800/257-7222. ♦



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## FOCUS: WATER/SEWER

# EVOLVE OR DIE

Gainesville Regional Utilities continually expands and refines its GIS into a fully digital and highly capable system and a model for communities

By Angus W. Stocking, L.S.

**G**IS at Gainesville (Fla.) Regional Utilities has gone from an out-sourced system comprised of infrequently updated paper maps to an in-house, fully digital system that consists of a utility-wide GIS data-viewing application, survey grade GPS equipment, mobile GIS data viewing, inspections and redlining, and an in-house work management system tied to the GIS.

"So, yes, we've come a long way," says Steve McElroy, water/wastewater GIS administrator. Owned by the City of Gainesville, GRU is Florida's fifth largest utility and is unusually comprehensive, providing electric, natural gas, water, wastewater and telecommunications services to 89,000 retail and wholesale customers in Gainesville and surrounding unincorporated areas.

The water/wastewater department maintains 1,069 miles of water line, 129 miles of sewer force main, and 593 miles of sewer gravity main. GIS has a clear role to play in administering any big utility's water and wastewater programs. But GRU's initial GIS push actually began in the electric

department in 1985, with an independent department initiative to build an Automated Mapping/Facilities Management (AM/FM) system on a mainframe computer.

By combining operational area expertise with enterprise-wide data availability, and by working with traditional support departments like administration, GRU has crafted an approach to GIS that serves all departments well and allows useful growth and evolution. The agency is doing something right: GRU recently took home the 2008 Geospatial Information & Technology Association (GITA) Excellence Award, a major industry honor that recognizes "dedication, insight and a

**"We don't really have a GIS department, just GIS specialists like myself that support the different operational areas."**

Steve McElroy

high degree of initiative in the outstanding application of geospatial technology."

### Starting early

As early as 1988, facility maps produced by this system were

Rodney Dougherty (left) and Kyle Wheeler of Gainesville Regional Utilities use the three-part Top Con GPS system to plot points and survey water lines in the city. Wheeler uses the hand-held data collector while Dougherty points the Prism infrared receiver at the robotic station that is down the road. (Photography by Brad McClenny)

**PROFILE:**  
Gainesville  
Regional Utilities,  
Gainesville, Fla.

**POPULATION:**  
114,000

**INCORPORATED:**  
1869

**SERVICE AREA:**  
49 square miles

**CUSTOMERS:**  
89,000

**SERVICES:**  
Natural gas, water, wastewater, telecommunications

**WEB SITE:**  
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At right, the robotic total station. Below, Lisa Adams, civil engineering graduate student and GRU intern, demonstrates how the Panasonic Tough Book is used in the field to show the survey that was done with the GPS system.



tem that has evolved is "an integral part of nearly all utility functions and can now best be described as a successful and robust partnership between the operating departments and the planning, information technology and administrative departments."

McElroy notes that discipline-specific data layers are owned and maintained by the operating groups, but all data is corporately owned and maintained, and available to all segments of the utility and local government. "We don't really have a GIS department, just GIS specialists like myself that support the different operational areas," he says.

Callis says the concept, design, development and funding of new GIS applications is centered within the operating areas. Deployment is realized through a partnership between the operating and information technology departments.

For the water/wastewater department, this meant that during the mid- to late-1990s, much time was spent building digital asset and facility plans, and working with information technology and other departments to overlay these plans onto a common land base. By 2000, water and wastewater maps were routinely available and included maps and views like alignments,

facilities, manholes and conduits, and profile sheets.

### Getting precise

One-foot contours and high-resolution aerial photography are available throughout the system. Since then, the system has become steadily more comprehensive, sophisticated and useful. The department uses its own licenses of ESRI ArcGIS and ArcFM to update and produce maps, along with customized scripts and editing tools to efficiently enter as-built information.

Maps are now updated at least weekly. To gather in-house and developer as-built information, the water/wastewater department has its own robotic total station and survey-grade GPS RTK receivers. Custom ArcReader applications are used for enterprise-wide GIS data viewing. "All of our engineers, planners and scientists have access to this system, which provides up-to-date GIS data viewing for any of their project needs," McElroy says.

The ESRI-based system is extended with third-party software. For example, Cityworks from Azteca Systems Inc., is used for work and asset management, and ties directly to the ESRI database without duplication of data. And Bentley's WaterGEMS and SewerGEMS are used for network modeling, analysis, and design. The two programs integrate with ArcGIS (one of their four supported platforms) and allow them to analyze their water systems directly within ArcGIS. "I don't deal directly with this," says McElroy, "I just support the engineers and planners with any geodatabase issues."

### Improving processes

Callis says numerous work processes are improved or enhanced by the current GIS. They include record keeping, standardizing of symbols, standardizing of materials and work practices, large- and small-scale project tracking, development review, system planning, system restoration and mainte-

## CITED FOR EXCELLENCE

The Excellence Award that Gainesville Regional Utilities received from the Geospatial Information & Technology Association (GITA) is a prestigious honor.

GITA is a nonprofit educational association whose roots go back to the late 1960s, when a group from the Public Service Company of Colorado was one of the first utilities to develop an automated mapping/facilities management system. The success of that early system led to a seminal 1978 conference and an association named AM/FM International. In 1998, the group adopted its current name.

GITA has given its Excellence Award since 2002. It recognizes organizations that implement geospatial technology in outstanding applications, especially multifaceted applications that influence the totality of large institutions.

nance, underground facility identification and location, infrastructure information dissemination, and vegetation management.

As in any GIS implementation, achieving buy-in was critical. Callis had a definite plan for building cooperation. "We achieved and maintained buy-in by peer groups, corporate support groups and senior management through continuous project championship by a senior operations manager," he says.

"We also periodically showcased existing and envisioned methods of GIS, with specific emphasis on real-world applications that would enable improvements to operating groups' effectiveness and efficiency," Callis says. Also important were an adequate budget and staff, trust of GIS staff by senior management, improved network resources, and improved relational database technology.

By thinking about buy-in from the beginning, and by including traditional support departments, like administration, in GIS planning, GRU has avoided many of the turf wars that often accompany broad new technologies.

By leaving update and design of new GIS features to operating departments, while also relying on the information technology department to implement new features, GRU has captured the strengths of its unique mix of utilities, in addition to the traditional strengths of GIS. Both orientations have been keys to the growth of GIS at GRU.

### Keeping it all together

Because the GIS has developed over time, mostly in-house, GRU is still discovering new uses for the technology and new ways to inte-

grate it into daily operations. Field access, for example, is still evolving.

"Our IT department has set up several hotspots at strategic locations throughout our service area and that lets field crews download or upload data via a secure FTP client," McElroy says. "As far as a dynamic system that pushes data both ways on the fly, we don't have anything like that yet. Some of our field guys do use a remote desktop connection via Sprint broadband cards."

Still, when full field access arrives, it will likely be perfectly tailored to GRU's needs in a way that an off-the-shelf system never could be.

Similarly, the utility's CCTV setup is not yet integrated with the GIS, though McElroy has been thinking about it. GRU uses Granite XP software from CUES Inc. to store and organize video data.

The fact that hands-on operators rather than outside consultants make the integration decisions means GRU ends up with the system that is right for the agency at the time and is not being hurried into decisions that don't need to be made yet.

Looking ahead, the water/wastewater department is focusing on mobile applications. "We've just implemented GO! Sync Mapbook from TC Technology for field inspections, primarily storm response, and redlining," McElroy

says. "We're right in the middle of configuring and optimizing the applications, and we've gone live with a few individuals."

And McElroy adds that the management team is hoping an

**"All of our engineers,  
planners and scientists  
have access to this system,  
which provides up-to-date  
GIS data viewing for any  
of their project needs."**

**Steve McElroy**

enterprise asset-management system will come online within five years or so. "That will be a massive project, and is still in its infancy," he says. "Ultimately, we're planning on the system, which will run on SAP, being tied into our GIS."

### Benefits

Callis estimates the benefits from GIS implementation at \$3 million. He can't put hard numbers to everything, but he does know, for example, that reducing the manual mapping staff is saving \$360,000 per year, and he puts the annual figure for improved project planning at \$25,000.

But he's also quick to list intangible benefits. Superior customer service is "priceless," and he likes the "trust by field personnel in the completeness and accuracy of our mapping products." Other hard-to-quantify benefits include fewer network outages, marketing applications, and better accuracy and detail for mid- and long-term planning.

Having learned by doing, GRU's home-grown GIS experts are busily giving back to the GIS

community in their regions by addressing local groups. Staff members presented on Land Base Layer Maintenance to the Alachua County GIS Users Group, and on Proper Procurement and QA/QC of Digital Orthophotogrammetry to the Alachua County Property Appraiser. By taking leadership roles, they're raising the bar for geospatial information and products in their region.

GRU's sense of satisfaction with its own GIS is palpable. The staff is proud of the recognition from GITA, but the tremendously improved utility of the system means even more. "Demonstrated, measured and continuous success has enabled GIS to evolve from an operating departmental effort in the mid-1980s with a grand vision, to that of an invaluable corporate resource of today," Callis says.

And the really nice thing is that the GIS will only get better with time. ♦

**Jack Goff uses the RTK real-time kinematic GPS to plot base points for the day's survey.**



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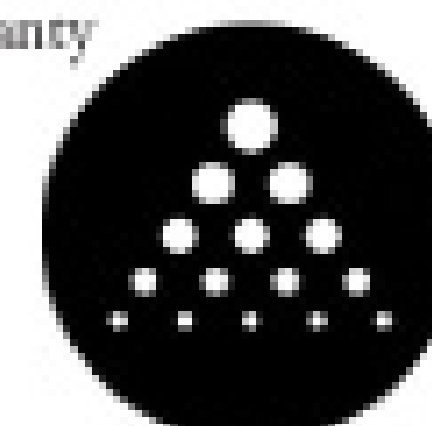


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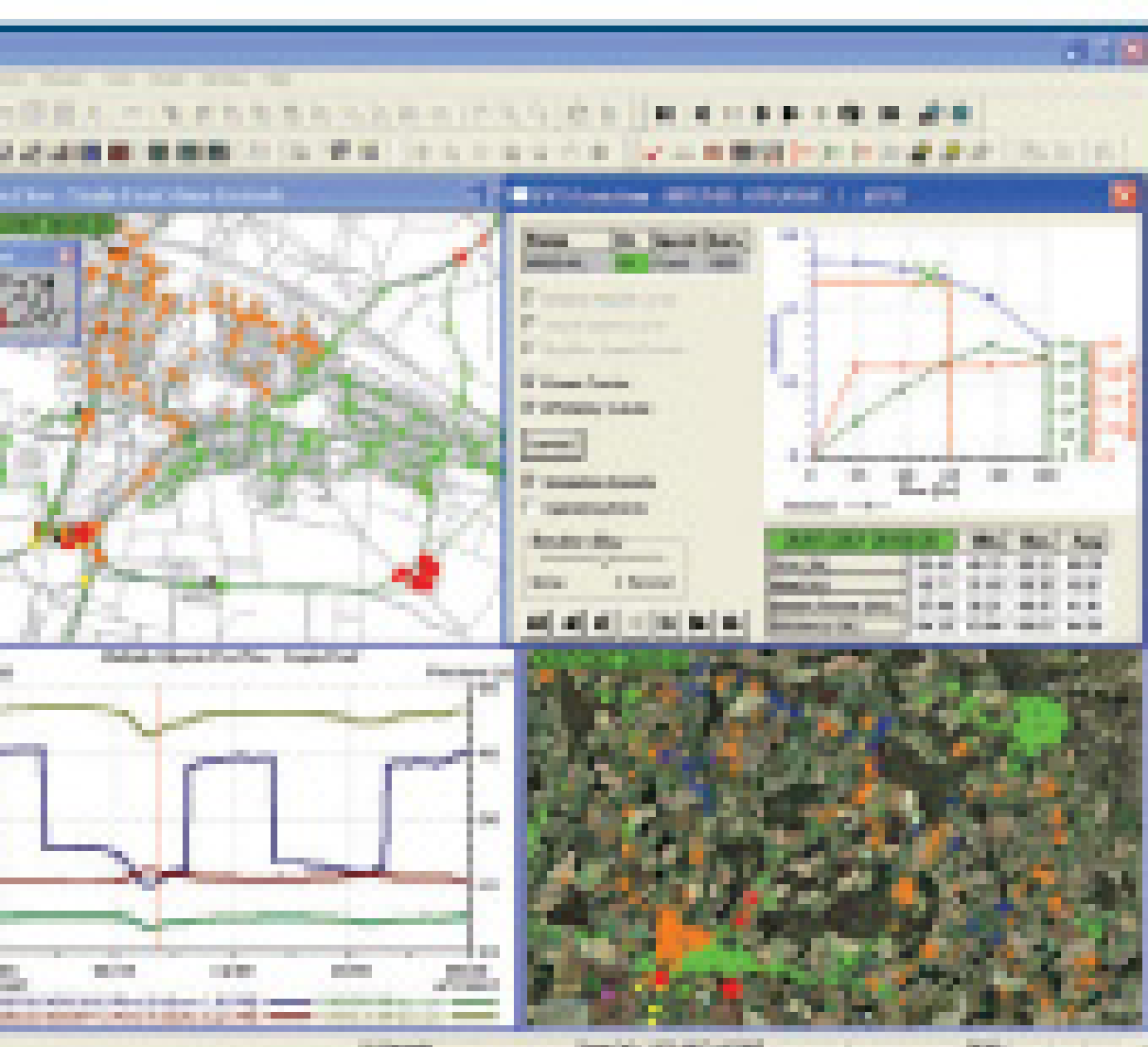


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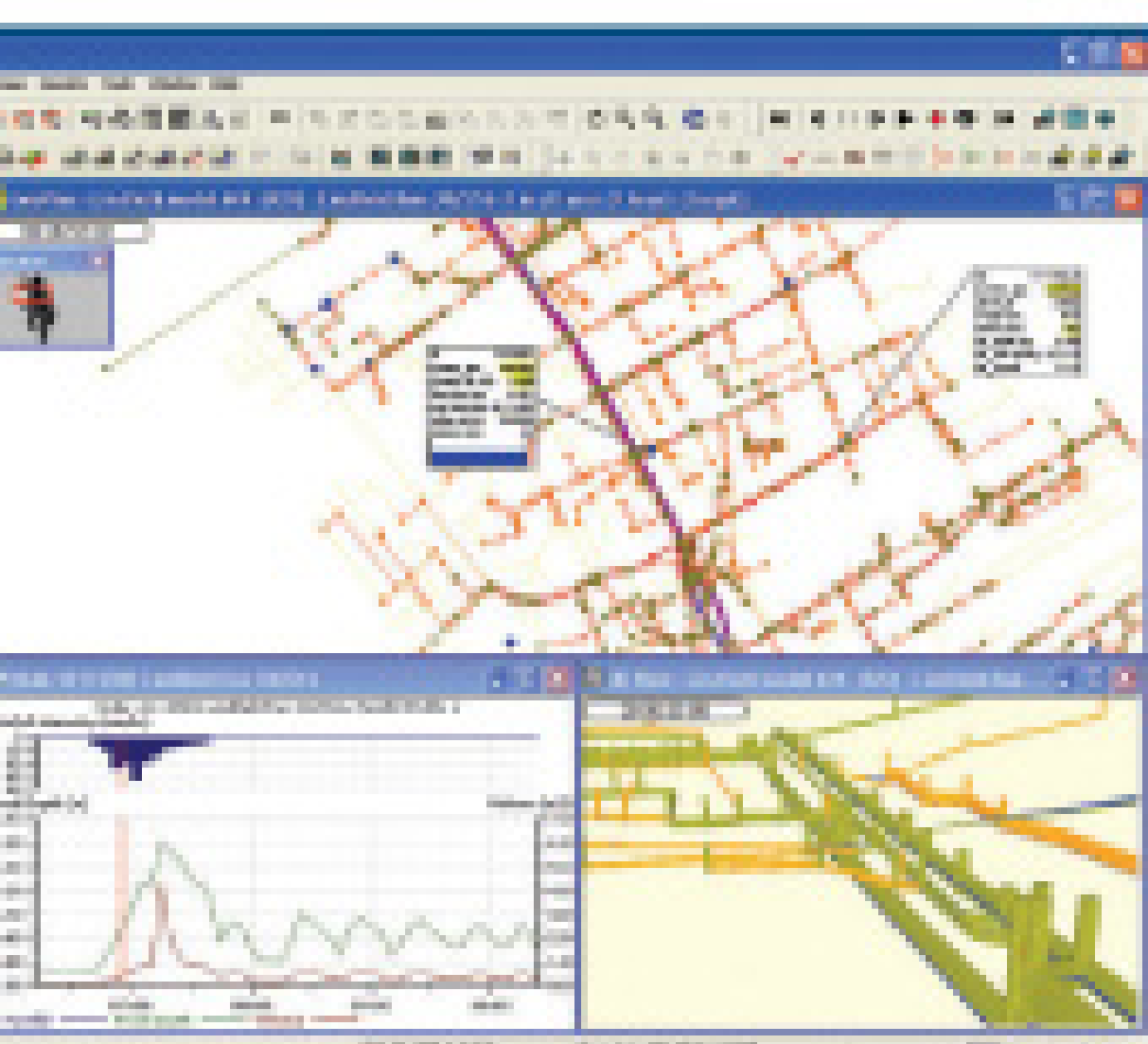


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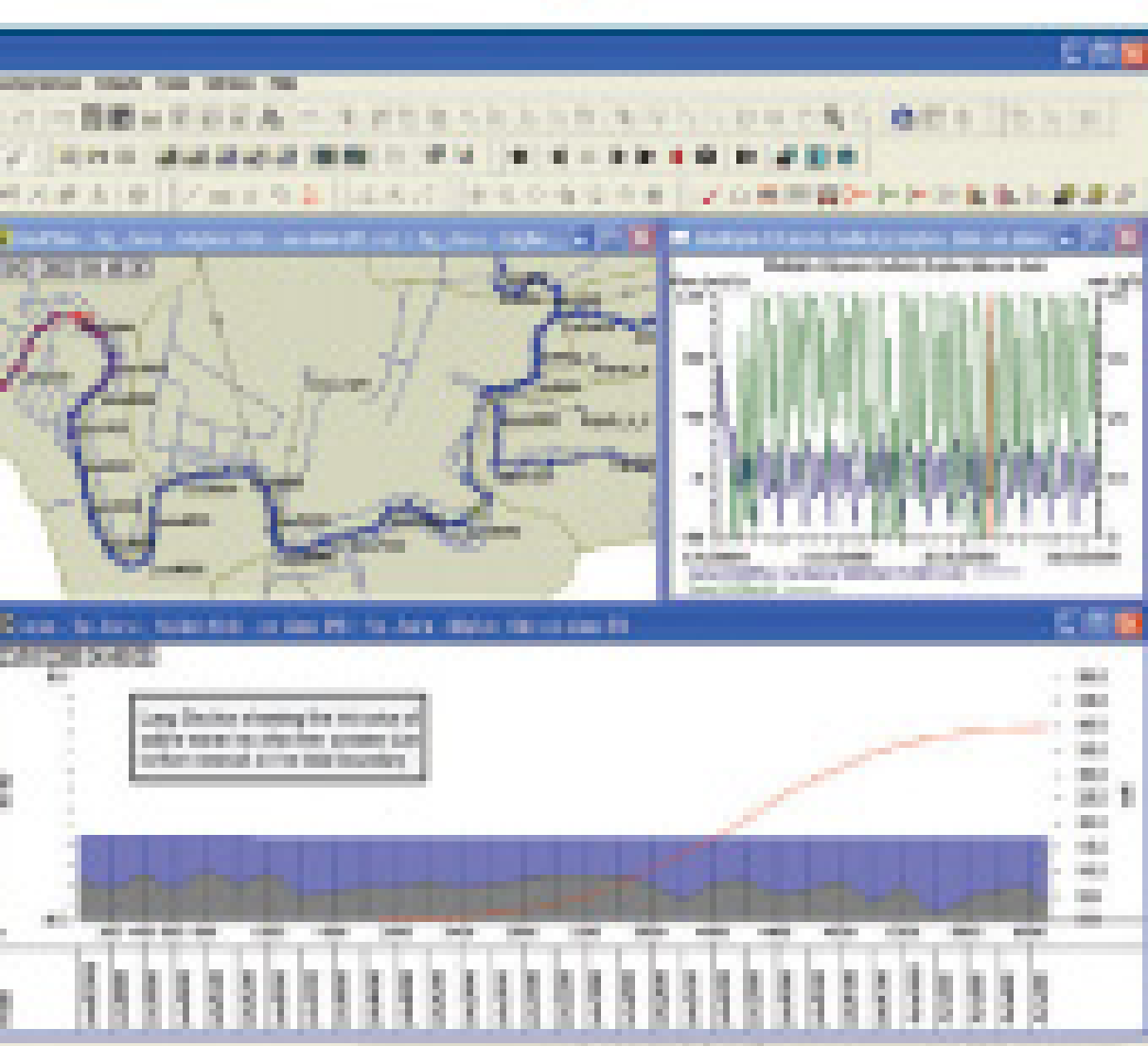
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# GREEN ARMY ON THE MARCH

Green infrastructure is at the forefront as the Metropolitan Sewer District of Greater Cincinnati mobilizes to eliminate CSOs and SSOs and hold down rates

By Dan Heim

**H**amilton County sits immediately north of the Ohio River, at the southwest corner of Ohio, near the lowest point in the state. Cincinnati is its major metropolis. Aging infrastructure has led to a continuing problem with CSOs and SSOs, but the Metropolitan Sewer District of Greater Cincinnati is on track to eliminate them by 2038.

The key to the plan is a broad collaboration of municipal and

political leaders, and an informed citizenry, all concerned with protecting environmental quality. And a critical part of the solution is a wide variety of green infrastructure for stormwater control.

"The Earth Day generation has now reached positions of power and influence, so there was an 'underground army' ready to strike when given the chance," observes

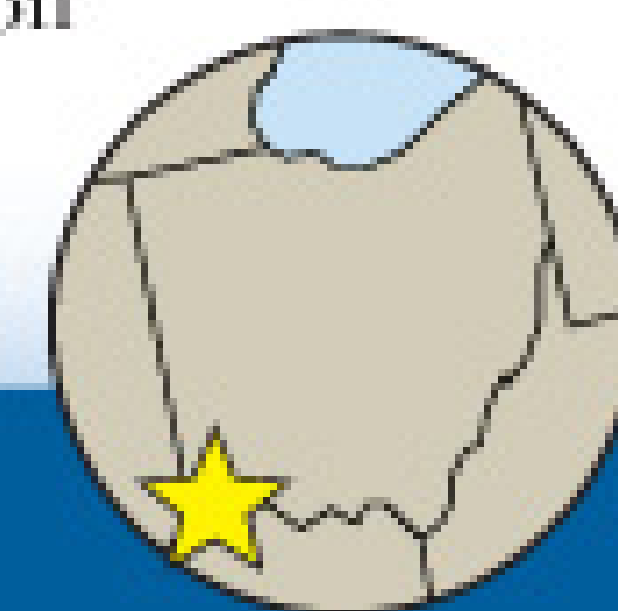
Karen Ball, MSD compliance coordinator for the county. The first Earth Day was on

April 22, 1969, and it strongly influenced a generation bent on social and environmental change.

MSD's coalition includes leaders from 49 jurisdictions, including the Ohio DOT and the Transportation and Planning Agencies of Cincinnati and Hamilton County. The district also has the support of the local chapter of the Sierra Club. It's this powerful coalition of people and perspectives that allows MSD to move forward with a host of innovative solutions to its CSO and SSO dilemma.

## Tough geology

In addition to the aging infrastructure, MSD's task is made more difficult by the sheer magnitude of the system (3,100 miles of sanitary and combined sewers), the large fraction of impervious surfaces in its jurisdiction (38 percent), less-than-favorable soil conditions, and a



## PROFILE: Metropolitan Sewer District of Greater Cincinnati, Ohio

**SERVICE AREA:**  
Hamilton County

**CUSTOMERS:**  
800,000

**COUNTY AREA:**  
413 square miles

**ANNUAL PRECIPITATION:**  
40 inches average

**INFRASTRUCTURE:**  
3,100 miles sanitary  
and combined sewers;  
200,000 taps; 11 treatment  
plants; 126 pump stations

**ANNUAL BUDGET:**  
\$181 million operating, \$730  
million capital (2008-2011)

**WEB SITE:**  
[www.msdcg.org](http://www.msdcg.org)

Cincinnati Metropolitan Sewer District senior engineer Mike Flanders, left, and compliance officer Karen Ball check the progress of the growth of sedum on the roof of the wastewater collections division office annex. It was planted to help make use of rain water, preventing much of it from entering the stormwater system. A monitoring device is located at the bottom of the building. MSD is encouraging businesses and individuals to join its green infrastructure project. (Photography by Bruce Crippen)







Young visitors to the Cincinnati Zoo and Botanical Gardens read about the green roof (background) on the giraffe barn. From front to back are Sarah Theis, 10, Chelsea Cookingham, 12, and Clarissa Cookingham, 13.

shrinking tax base due to an exodus of residents to adjoining counties.

MSD's service area lies in what is best described as a topographical funnel: Runoff from adjacent areas is channeled in by natural drainage slopes. Further, the area contains a large percentage of impervious surfaces. The district's GIS records a total of 96,317 acres of land, 37,053 of which are impervious.

The soil is less than ideal. Some 60 to 70 percent of it falls into hydrological soil groups C and D. The "good" soils (A and B) lie mainly along the floodways of major water courses, such as Mill Creek and the Great and Little Miami rivers. And 40 percent of this soil area has high water tables averaging 10 to 30 feet. With an average of 40 inches of rainfall each year, it's not surprising to see frequent CSOs and SSOs.

Before joining MSD, Ball worked for three years as a legislative aide for the City of Cincinnati, and six years as an aide to the Hamilton County commissioners. At that time there were few environmentally sensitive elected officials. Most policy makers were driven by a "sprawl mentality," pushing development for its own sake.

"Smart growth principles we

**"The Earth Day generation has now reached positions of power and influence, so there was an 'underground army' ready to strike when given the chance."**

**Karen Ball**

promoted were not popular in the mainstream developers' minds," Ball recalls. "Infrastructure conditions in the city core and first-ring suburbs were causing problems. Oddly enough, the CSOs didn't seem to matter.



A crew at the Cincinnati Zoo works on construction of a new entrance, called the Vine Street Village. This was the original entrance 100 years ago and is referred to as the renewed front door. Workers from left are Mike Gemmer, Leo Mora, Scott Buckler and Matt Hayes of Performance Site Construction. Cincinnati MSD is helping fund the village, which will be a bio-retention area. The water collected here will be routed to the moat at the elephant enclosure.

"The tables turned in 2006 when Hamilton County board commissioner Todd Portune, previously the lone voice for the environment, was joined by others who shared his vision," Ball says. "The majority on the boards shifted at both the county and state levels and opened the door to new con-

versations about how to solve the problems."

versations about how to solve the problems."

Still, Ball's coordination effort is a formidable task. With 49 jurisdictions to juggle, and a need for consistent strategy throughout the system, communication is key. In

### **Consent decree**

Under the Clean Water Act of 1977, cities are required to reduce (and in some cases eliminate) the release of untreated wastewater through CSOs and SSOs. Because this remediation can be a long-term, expensive project, MSD began negotiating in 1997 with the EPA, the U.S. Department of Justice and the State of Ohio. The goal was a response plan that would be recognized and supported by the government, and affordable to local ratepayers.

The first result was an Interim Partial Consent Decree, accepted

## **UNIQUE IN HISTORY AND GEOGRAPHY**

The first settlers arrived via the Ohio River in 1788 and established the town of Losantiville (later Cincinnati). In 1790, Hamilton County was organized as the second county in the Northwest Territory. It enjoyed rapid growth during the 1830s and 1840s with an influx of German and Irish immigrants.

The county lies in a region of gentle hills formed by the slopes of the Ohio River valley and its tributaries. The Great Miami River, the Little Miami River and Mill Creek also contribute to this system of hillsides and valleys.

The county seat is Cincinnati, and as of 2000, the population was 845,000.

This made it the third most populous county and second most densely populated county in Ohio. The county is named for the first secretary of the treasury, Alexander Hamilton.

Ohio, the Buckeye State, is named for its state tree, the nut of which looks like the brown eye of a deer. Its genus includes the common chestnut tree. Ironically, according to the Pew Environment Group, unchecked global warming would push the tree's ecosystem farther north, into Michigan — the Ohio State Buckeyes' longtime NCAA football rival.



Karen Ball of Cincinnati MSD demonstrates the use of a rain barrel that collects rain water for garden use. This voluntary residential project is being conducted by the research and development arm of the U.S. EPA.



A rain garden is installed on this residential property, which is watered by rain water from a downspout.

by all parties in February 2002. Under this plan, MSD must:

- Eliminate the 17 most active SSOs by the end of 2007.
- Develop a plan to resolve the remaining SSOs by 2022.
- Develop a computer-based model of the sewer system to better determine capacity limits and future planning.
- Build a temporary treatment plant to reduce the discharge from SSO 700 (the system's largest) while implementing a permanent solution.

This was followed, one year later, by the Global Consent Decree, a draft of which is still under review. If it is approved, MSD would:

- Complete 23 pre-identified projects to reduce CSOs.
- Update and implement its Long-Term Control Plan (LTCP) to include comprehensive water quality testing, computer modeling, cost/benefit study of options for correcting CSOs, and public review.
- Implement enhanced CSO control, response and public notification.

- Invest \$5.3 million in local environmental enhancement projects.
- Pay \$1.2 million in fines for past SSOs and CSOs.

The three regulatory agencies were not entirely satisfied with some aspects of this plan, primarily the 9 billion gallons of untreated runoff still impinging on Lower Mill Creek. This necessitated MSD's revised Wet Weather Improvement Program (WWIP), submitted in September 2008. Changes include a budget increase from \$1.99 billion to \$3.29 billion, enhanced high-rate treatment technology combined with increased storage capacity, and elimination of proposed in-system disinfection and screening from the plan (because effective green infrastructure made these measures unnecessary).

In addition, MSD will enact a Water-In-Basement (WIB) Response Program, the goal of which is to eliminate basement backups. This program includes:

- A new process to help MSD respond quickly to customer calls.
- One-on-one customer service

for people experiencing WIB issues.

- Cleanup service to help remove standing water and debris from affected homes, including disinfection and deodorizing.
- Reimbursement for property damage (subject to legal conditions).
- Installation of WIB preventive measures such as check valves and isolation pumps (short term), and increased system capacity (long term).

### Potential costs

The Global Consent Decree, if approved, represents a massive and costly project. And there are still some major unresolved issues. Depending on the efficacy of green infrastructure tactics, it may yet be necessary to build "The Tunnel," a 25-foot-diameter conveyance structure 6 miles long, up to 150 feet deep, to channel combined flow to the Mill Creek treatment plant.

Part of the original Corps of Engineers plan, the tunnel was shelved in 2004 because of funding shortfalls. Total cost to meet the Consent Decree would be capped at \$3.2 billion, spread over 30 years (if the tunnel is needed). MSD still sees the tunnel as a last resort and hopes to avoid it through green infrastructure and other measures.

Service rate increases will be necessary. For 2008, the increase is projected at 12 percent, raising the

average quarterly sewer bill by about \$23. More increases are expected in the future. MSD knows some customers are financially vulnerable. All rate increases must be approved by the Board of Commissioners.

Industrial and commercial customers (including apartments), comprise the bulk of MSD's system load. These customers tally about 15 percent of the service area, and 24 percent of the impervious surface. The properties provide dramatic opportunities for stormwater control that can offset potential rate increases.

### Potential solutions

The scope of MSD's project is characterized in its 86-page Green Infrastructure Program. Here, the district details how it intends to win the war. Although the task may seem daunting, the coalition of green forces enables solutions.

"I threw myself in front of the stormwater bus, and the grass roots folks were there to pick me up," Ball notes. At first pleasantly surprised by the groundswell of support, she quickly learned to leverage that support into real progress. The engineers believe they can reach 85 percent CSO and SSO control, or better, in some cases simply by using green storage solutions.

Solutions include rain gardens, vegetated swales, pervious and porous pavement, green roofs, sedimentation catchments, recharge



wells and gray-water systems for irrigation. The National Resources Defense Council released its "Rooftops to Rivers" report in May of 2006, validating these solutions with case studies, and encouraging their adoption nationwide.

The grassroots army has been mobilized through programs like the Greenacres Foundation Project for the Little Miami, a National Scenic River. This community outreach effort allows volunteers to monitor and sample local rivers and streams, testing for pH, conductivity, nutrients, sediment and bacteria. The project is in its fifth year, and MSD hopes to use the results to document the efficacy of green infrastructure.

One noteworthy project is the 1600 Gest St. project, part of a countywide commitment to reducing runoff from public structures. This MSD-owned property includes 11 acres of buildings and other impervious surfaces. Early estimates place the cost of study, design and construction at \$500,000. Green technology installed here would significantly reduce outflow and,

perhaps more important, serve as an example for others and provide educational exposure to the public.

Another innovative project is the U.S. EPA-sponsored "reverse auction" program for rain barrels and gardens in the Shepherd Creek watershed. Homeowners are allowed to place open bids on the materials to build rainwater retention systems on their properties,

**"I believe restoration of the ecosystem on private properties is key to keeping stormwater out of the system. There will be monumental costs, and it will take a lot of collaboration, government included, to get the job done."**

**Karen Ball**

and MSD provides the funding and coordination with local contractors. This popular program is making an impact on runoff and infiltration and will be expanded pending results of monitoring and analysis.

#### **Outlook for the future**

MSD's immediate priority is to


get the green infrastructure up and running. To make this all happen, Ball oversees the capital budgets, reviews capital expenditures before they go to the commissioners for approval, coordinates MSD work with NPDES Phase 2, manages development of rules and regulations (and works to get them passed), and negotiates with the Sierra Club for continued support.

nologies. Changes are needed to permit these applications as required.


Current work focuses on increasing the capacity of 12 wastewater treatment plants, improving conveyance, and reducing treatment loads with green infrastructure. One new treatment plant is planned for the northern part of the county, where gravity service will provide an effective long-term solution. This will eliminate two pump stations, the antiquated Wade Mill treatment plant, and a 30-year-old large force main that feeds the Mill Creek treatment plant.

Still, at the end, it all comes down to basic and established ideas. "I believe restoration of the ecosystem on private properties is key to keeping stormwater out of the system," Ball says. "There will be monumental costs, and it will take a lot of collaboration, government included, to get the job done. Ultimately, the solution will be a mix of green and gray."


The "green army" has its marching orders, and the battle has been joined. ♦



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Hi-Vac Corp. modified the Aquatech B-10 combination truck to take unfiltered water from irrigation canals in California's Imperial Valley. The unit uses a 250-gpm trash pump powered by the truck's hydraulic system. (Photos courtesy of Hi-Vac Corp.)

# CLEAN CANALS

A custom-configured combination truck helps an irrigation district keep water canals clean and ensure constant supply to agricultural producers

*By Scottie Dayton*

**T**he All-American Canal, more than 3,000 miles of freshwater canals and drains, pulls 3.1 million acre-feet of Colorado River water per year to irrigate 500,000 acres of farmland in California's Imperial Valley. The Water Department of the Imperial Irrigation District (IID) maintains the system.

Where the open canals cross roads or bridges, the water funnels

through 48- to 72-inch concrete siphons, which trap materials. The biggest debris contributor is silt runoff from the fields. The Friday night ritual of kids throwing bales of alfalfa into the canals ranks second, followed by trash tossed from passing vehicles.

Blockages were a constant challenge, and the cleaning contractors IID hired weren't always immediately available. Slow responses

could jeopardize the valley's agricultural industry, worth \$1 billion per year.

Seeking a better solution, IID in 2006 purchased a combination cleaning/vacuum truck on a 2007 International chassis from Hi-Vac Corp. The Aquatech B-10 truck has a T-56 Hibon 3,600-cfm 18-inch Hg positive-displacement blower, 80-gpm/2,000-psi water pump, 10-cubic-yard debris tank,



and four 250-gallon saddle tanks for water storage. The machine enabled IID to develop an annual preventive maintenance program, overseen by Ron Jones, superintendent of heavy equipment.

#### Field hand

Of the water IID transports, 97 percent is used for agriculture. The canal is the valley's sole water source. "Our responsibility is to keep the siphons clear of blockages," says Jones. "After jetting the silt into the canal, the suspended sediment flows downstream and back to the fields."

Water in the canals can be 20 feet deep, and currents beneath the surface are swift, strong and hazardous. The biggest challenge maintenance crews faced with any combination truck was how to take on water once it left the yard. Consequently, the B-10 was modified to draw unfiltered water from the canals, as no other source was available.

Hi-Vac fabricated and mounted a bracket to the front bumper to hold a 250-gpm trash pump. The boom, which rotates 360 degrees, lowers the pump into the channel, while workers hook up the hydraulic and water hoses. The truck's hydraulic system powers the pump.

Previously, when hay bales, organic matter and litter blocked siphons and backed up water, crews used rods with grappling hooks to break up the dams. "It was labor-intensive, time-consuming work," says Jones. "With the jetter, we loosen and remove the debris in minutes. It's a big help, especially when it's 110 degrees in the shade." IID hired two operators, and Hi-Vac trained them.

#### Silt is the enemy

Some canals are cement, but 75 percent are still earthen. In some areas, canals run underground to slow evaporation. "Before

the truck arrived, maintaining those subsurface pipes was difficult," says Jones. "The B-10 has doubled or tripled our production and efficiency." Because the hose reel is mounted high on the back of the truck, workers can swing it over the above-ground manholes and jet in any scenario. Manholes are spaced one-quarter mile apart.

The IID also has 18- to 48-inch drain lines carrying leaching salts and agricultural runoff. Flows are much lighter in these pipes, enabling sediment to collect faster.

**"It [breaking up the dams] was labor-intensive, time-consuming work. With the jetter, we loosen and remove the debris in minutes. It's a big help, especially when it's 110 degrees in the shade."**

**Ron Jones**

"Our No. 1 enemy everywhere is silt, and it has the consistency of peanut butter," says Jones. "That's one reason why we selected the big Hibon. It vacuums heavy loads continuously and consistently." Crews typically fill the debris tank two or three times to unclog an underground pipe.

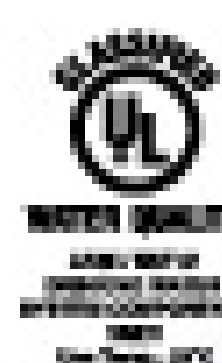
The specialized B-10 and IID's canal maintenance program have assured Imperial Valley farmers that their water supplies arrive as scheduled and at the proper hydraulic flow. ♦

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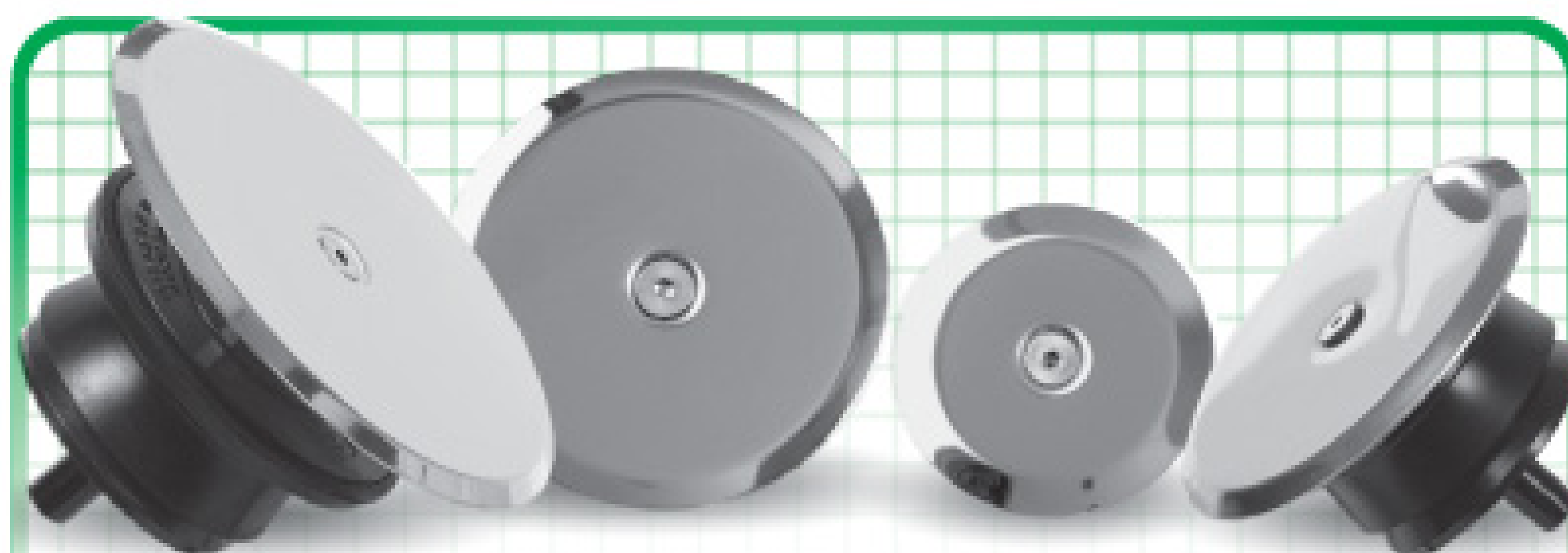


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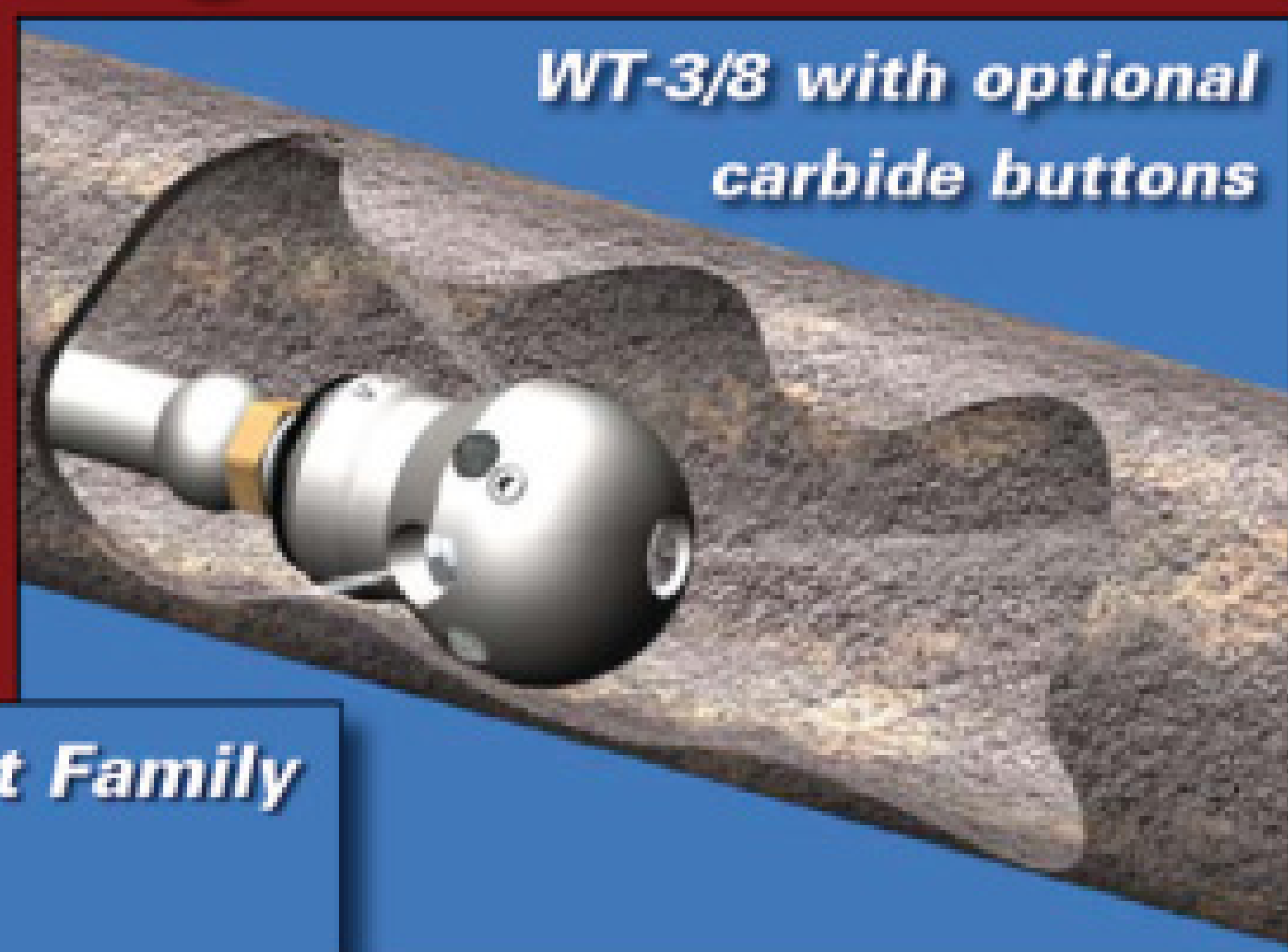
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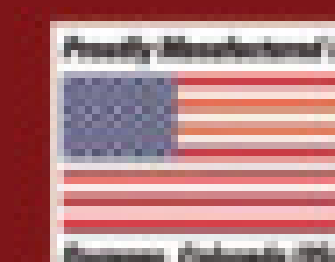
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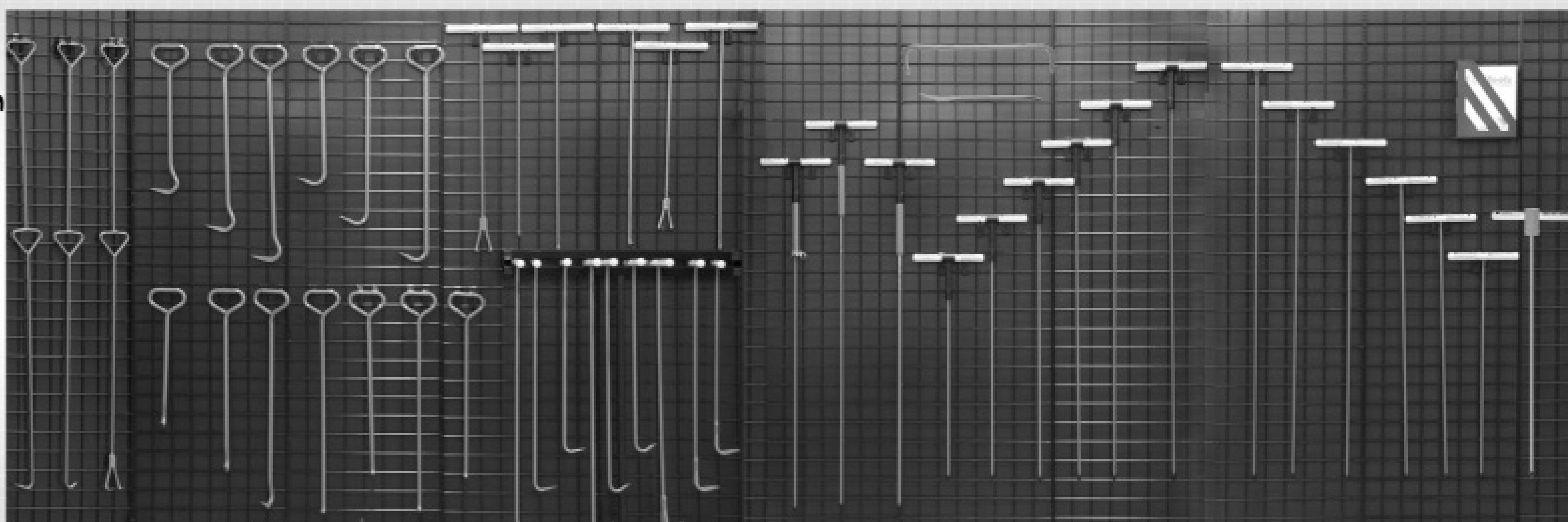
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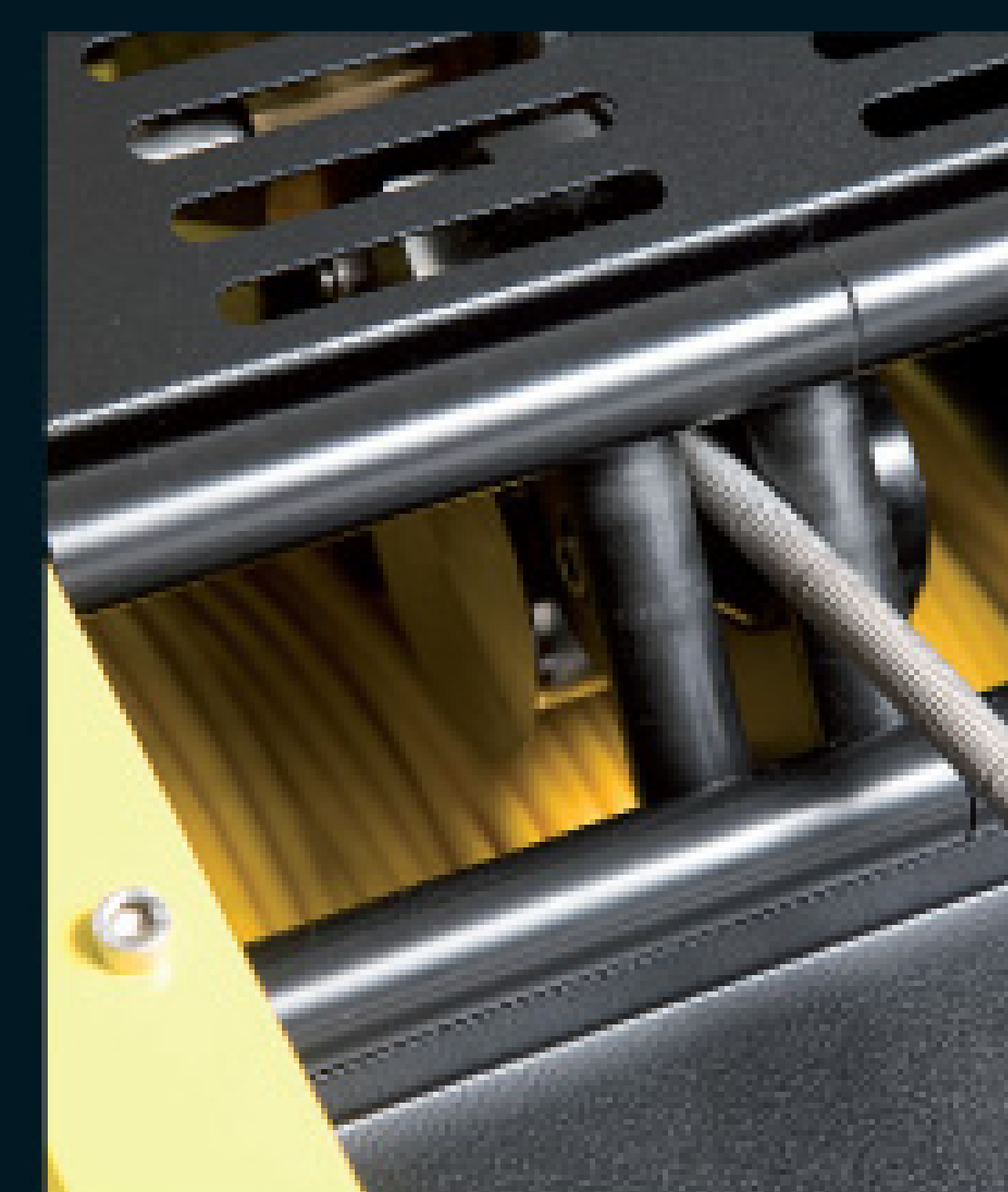
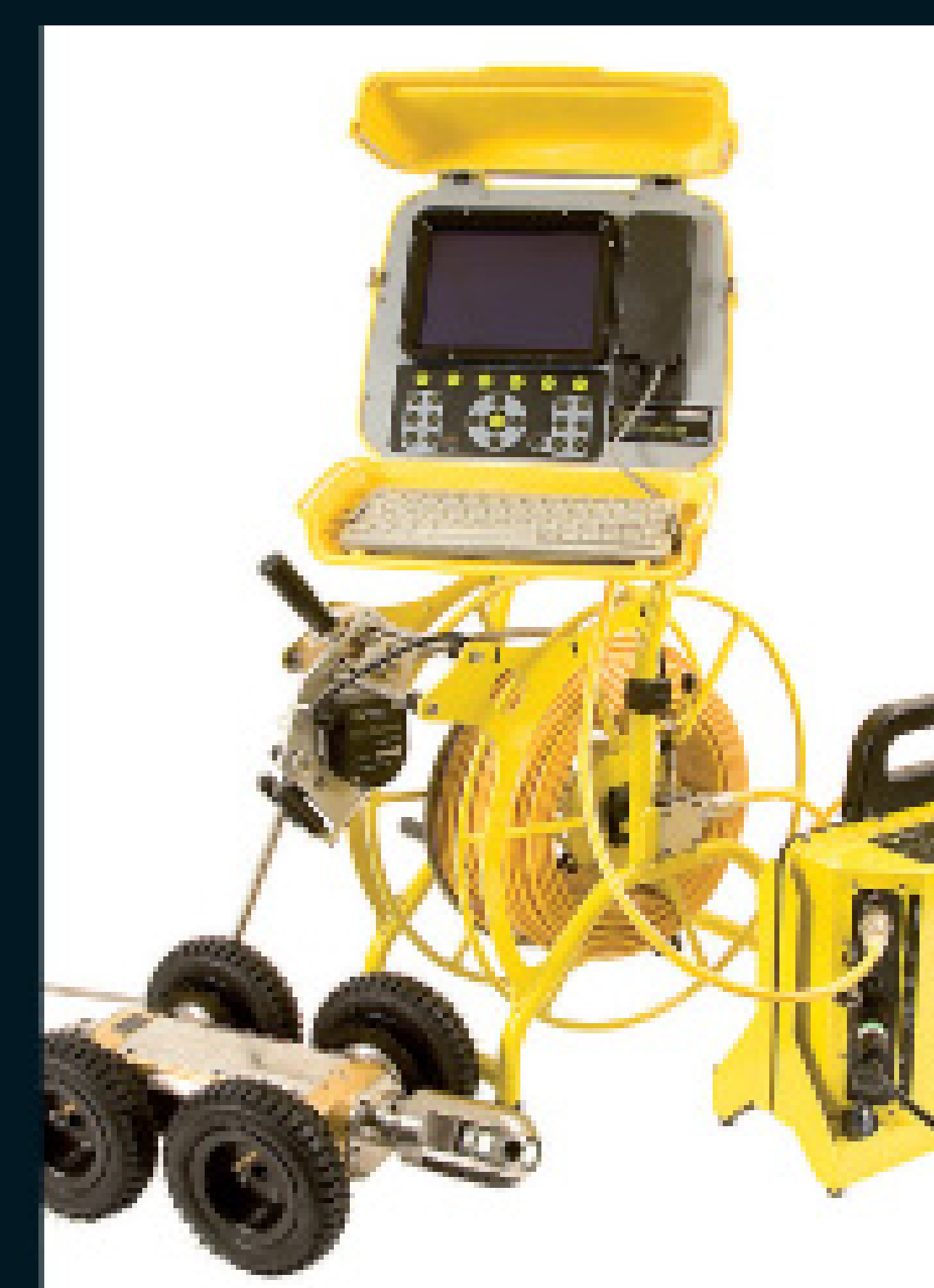
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# A BIRD'S-EYE VIEW

VUEWorks Inc. software works on top of GIS databases to allow users to link to and manage a wealth of information about public infrastructure

By Erik Gunn

Asset management software helps municipalities keep track of extensive infrastructure systems: history, specifications and maintenance.

Such software uses the power of personal computers to store libraries full of information that can be used to assess conditions, track breakdowns, prioritize repairs and manage the flow of work to keep the system in top condition.

VUEWorks Inc. of Concord, N.H., has introduced VUEWorks, a Core application and a series of software modules to enable managers to monitor and analyze data about water, storm sewer and sanitary sewer systems. The software operates on top of geographic information system (GIS) databases and uses map graphics produced by the Environmental Systems Research Institute Inc. (ESRI) of Redlands, Calif.

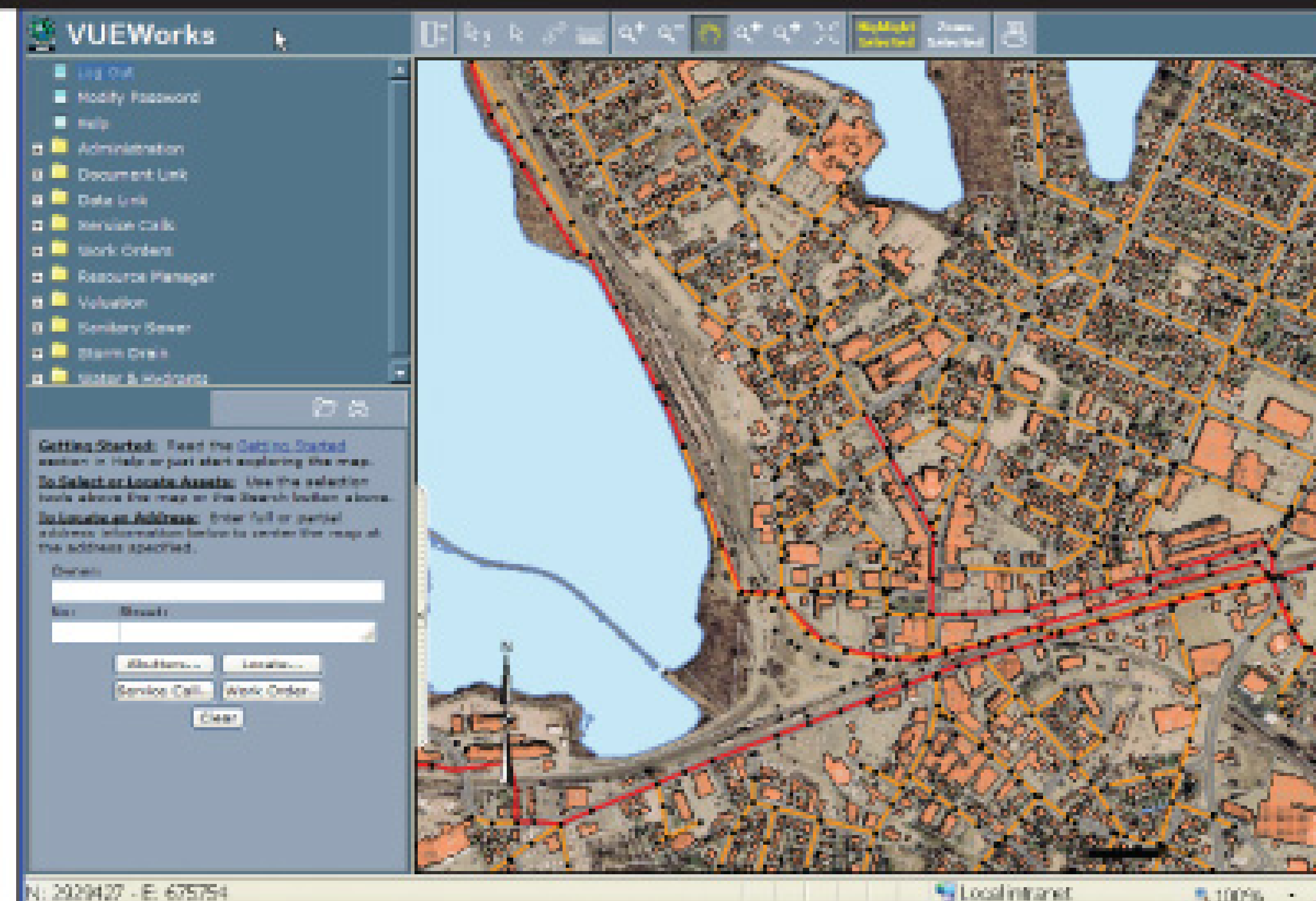
On Sept. 2, VUEWorks vice president of sales and marketing Alex von Svoboda, territory sales manager Ken "Chip" Spalding, and vice president and product manager Rod Lovely conducted a 90-minute demonstration of the software in a conference call aided by Web-based meeting software.

## Walk-around

VUEWorks uses a graphical

interface that is typical of modern Windows-based software. It is Web-based, operating over an organization's internal network and operated through an Internet browser, typically Internet Explorer.

That enables access by authorized users from any browser-equipped computer without the application being installed on the machine. This makes it possible, for instance, for service workers to use the application from laptop computers in the field as long as they can log into the internal network, such as through a wire-



**FIGURE 1.** The VUEWorks application is made up of three views: the Menu View (upper left), the Data View (lower left), and the Map View (right). (Images courtesy of VUEWorks Inc.)

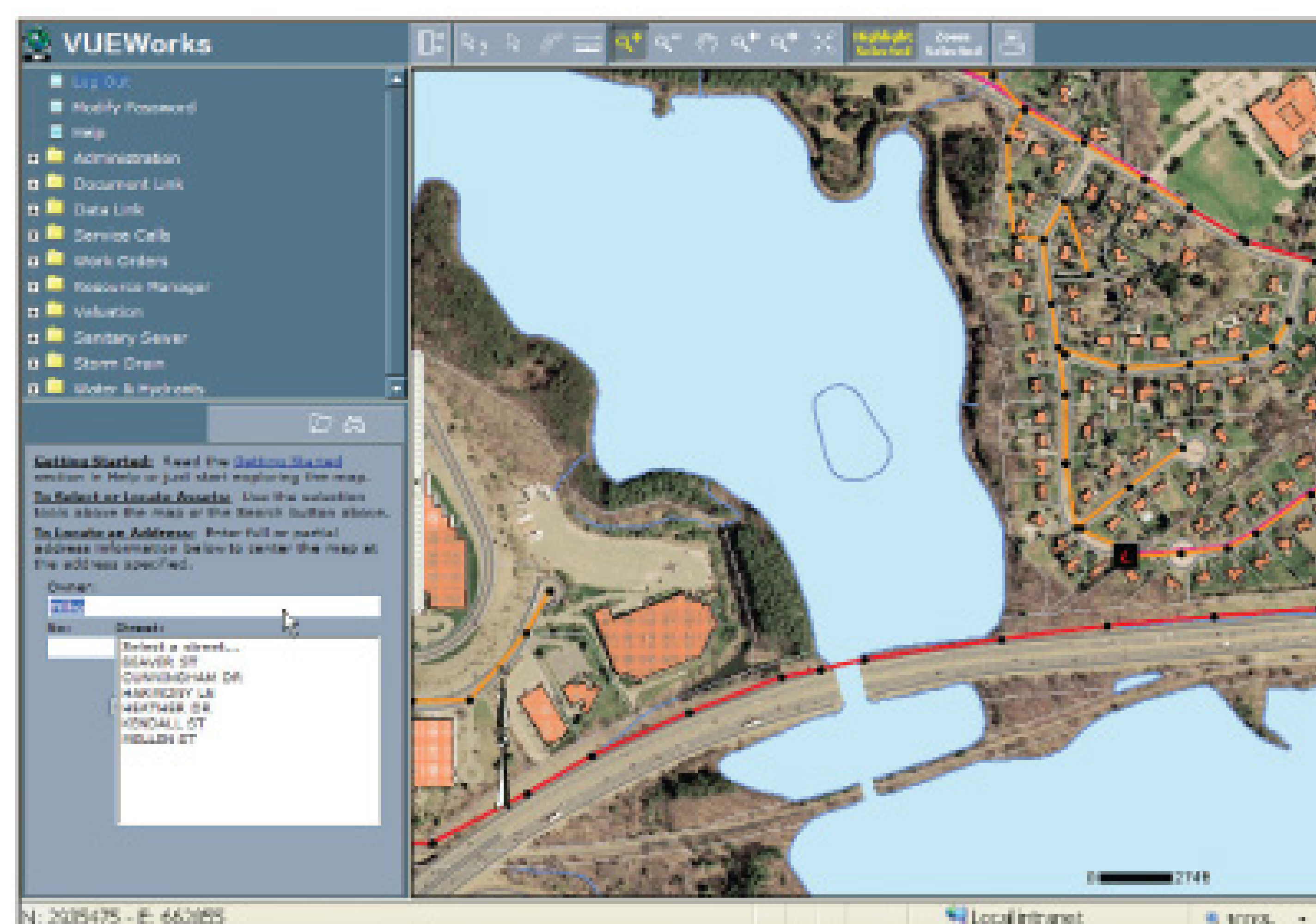
less connection.

VUEWorks presents a map of the community's infrastructure assets and then uses that map to give users access to extensive information about the assets, drawn either from the internal software database or from existing in-house databases.

Users log in with a user name and password from the Windows desktop. The software then opens in an Internet browser window. The standard home page interface is dominated by a map of the municipality covering the right

side of the screen. On the left side of the screen are two separate windows. The upper window, the Menu View, is a list of folders that can be clicked to activate specific databases and functions. The lower window, the Data View, is a workspace generally used for data reading and data entry.

The map can be generated by any number of GIS applications. In



**FIGURE 2.** A search function in the Data View window (lower left) allows the user to find a particular asset by customer name, street location or other attribute.

## TECHNOLOGY TEST DRIVE

**EQUIPMENT:**  
VUEWorks asset management software

**MANUFACTURER:**  
VUEWorks Inc., Concord, N.H.  
877/636-6413  
www.vueworks.com

**LOCATION OF DEMO:**  
Online via Web conference

**DEMONSTRATED BY:**  
Alex von Svoboda, Ken "Chip" Spalding and Rod Lovely, all of VUEWorks

**LIST PRICE AS DEMONSTRATED:**  
\$38,356 for all software modules plus first-year subscription for technical support and upgrades, for up to five users



VUEWorks, it can be clicked to call up specific information about particular infrastructure assets being managed, such as a sewer system. Features on the map can be linked to documents in external database files, such as inspection reports or photographs. Alternatively, specific assets can be opened by clicking on appropriate folders in the Menu View.

**VUEWorks presents a map of the community's infrastructure assets and then uses that map to give users access to extensive information about the assets, drawn either from the internal software database or from existing in-house databases.**

The Menu View can be configured based on the VUEWorks customer's specific needs. Items that might be in the Menu View include administration, document link, data link, service calls, work orders, resource manager, valuation, sanitary sewer, storm drain, and water and hydrants.

The application can manage a wide range of asset collections, and users can turn on and off different layers in the map interface so that they can see many sets of assets, or only one, such as a sewer system network.

In addition to the Core software, additional modules are available to enable such tasks as maintaining inventory, connecting to other databases, managing service calls, tracking financial metrics such as depreciation expense, and planning capital projects.

## Operation

After a PowerPoint presentation on the VUEWorks features and benefits, von Svoboda and Spalding started the VUEWorks software. It opened on a map with

a closeup of a neighborhood in a model city (Figure 1).

Spalding maneuvered the cursor over the map to a land parcel and identified its address. The Data View in the lower left corner of the screen offered information about the site, organized in a series of tabs. Tabs associated with a parcel can include attributes drawn from the GIS, such as the land dimensions, the street address, and information that might be in the plat book for the parcel; documents associated with the parcel; and other possible databases, including service calls, work orders and billing data.

Spalding clicked on the documents tab to bring up a directory of documents associated with the parcel. One was a document for the site's water service tie; Spalding clicked on it to open a record of the document.

Von Svoboda explained that VUEWorks uses attributes from the ESRI database to link to other databases in which scanned documents or images or other pieces of information may be stored. The only requirement is that the other databases are compliant with standards for Open Database Connectivity, or ODBC.

In the field, Spalding explained, this feature could be used on site to quickly research the records on a location that requires a trouble call, such as a leaking water main. "We bring all that information, whether it's scanned or whether it's databases, to the fingertips of someone who might need it out in the field or in the office," he says.

It is possible to set up the Data View tabs so that, for instance, billing and account data can be retrieved from external billing and account management software.

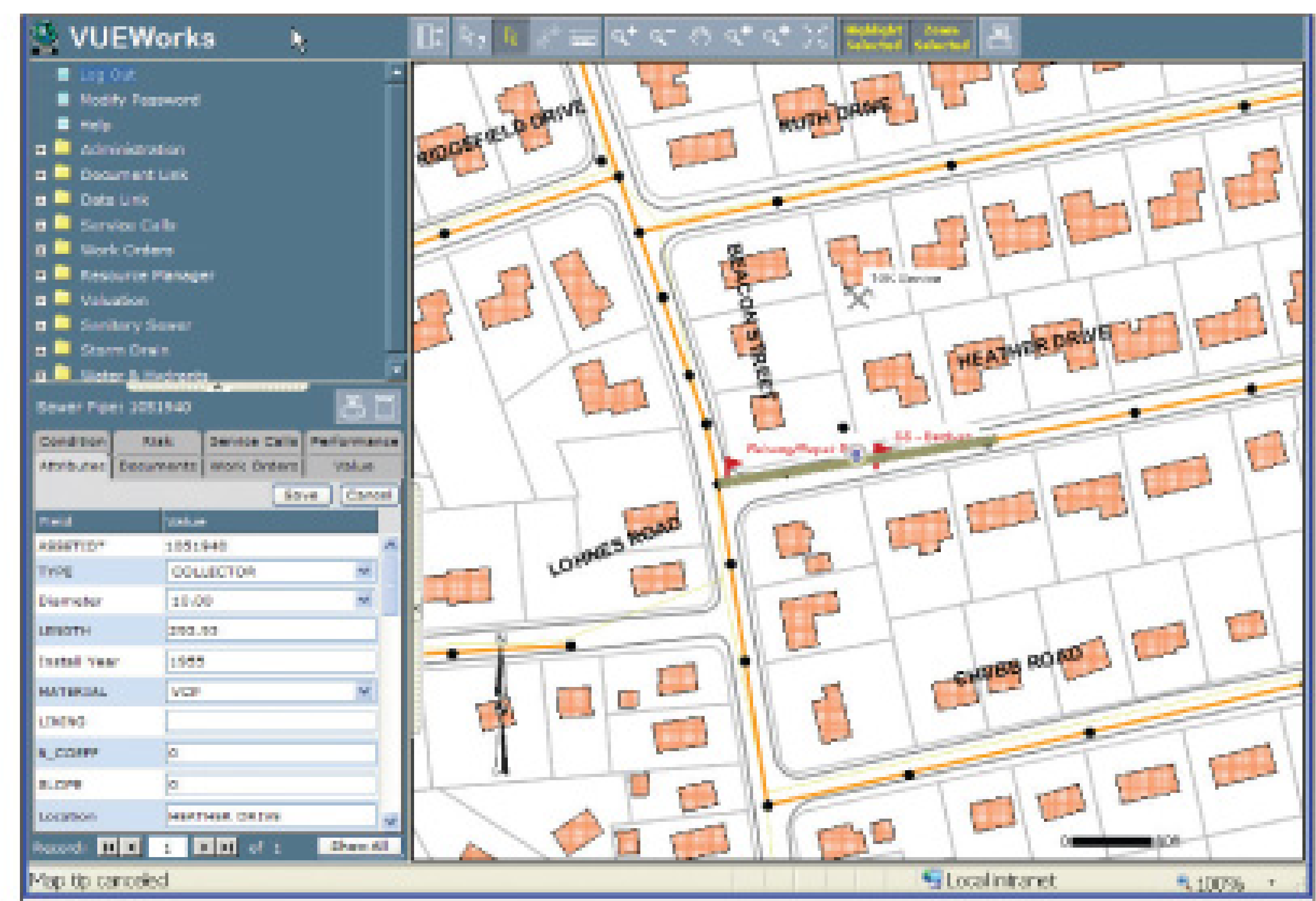
Spalding demonstrated an alternative way to gain access to data on a parcel. Clearing the existing parcel from the Data View window, he called up a search field and typed in the name of a property owner (Figure 2). The search

found a water service and a sewer service card for the customer. (It is also possible to search by other attributes, such as street names.)

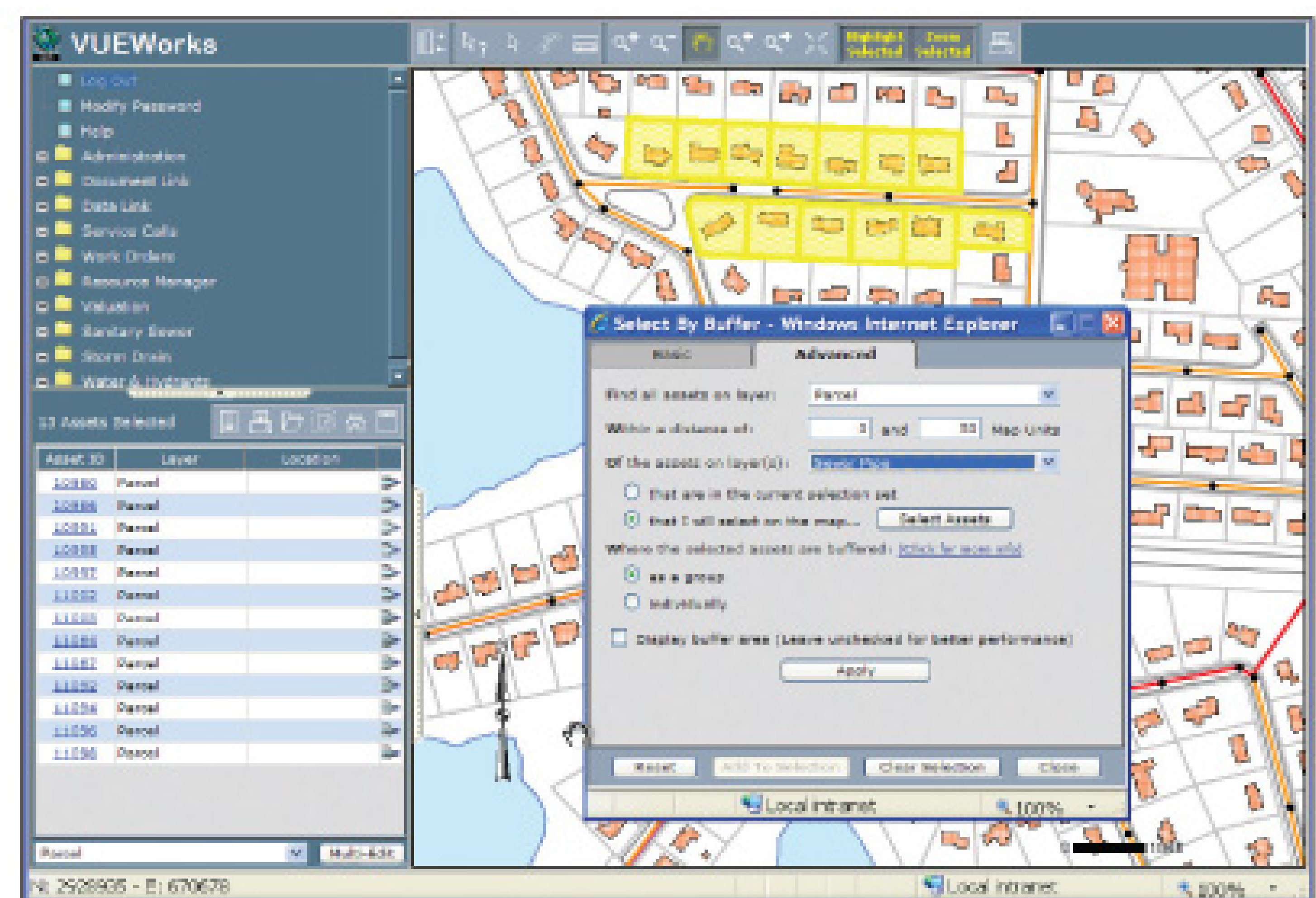
In addition to locating information by individual properties, the system can allow users to select an asset from the map, such as a stretch of sewer pipe or a lift station (Figure 3). The Data View then shows information and links to other databases pertaining to that asset.

Among buttons on a tool bar at the top of the map screen is one that controls the various layers of information visible on the map (Figure 4). Spalding clicked on the button, opening a menu showing the layers, then cleared all but the municipality's lift stations.

He then used the Data View search function again on the name of a particular lift station. The search highlighted the station on the map and produced a series of



**FIGURE 3.** The user can select a particular asset in the Map View (right), such as a sewer line, and review the attributes for that asset in the Detailed Data View (lower left).



**FIGURE 4.** The user can select a collection of assets using a buffer filter and review the highlighted assets in Map View (right) and the Selection Set View (lower left).

tabs in the Data View window associated with pieces of information about the station. Documents, including a photograph of the station interior, were among the items stored there.

Von Svoboda noted that motion-picture files in the AVI format, such as from a televised sewer inspection, can be linked to the asset's data through VUEWorks (Figure 5).

Information that doesn't already reside in external, ODBC-compliant databases can be entered in the software's own database, which is programmed using Structured Query Language (SQL), a standard database programming language.

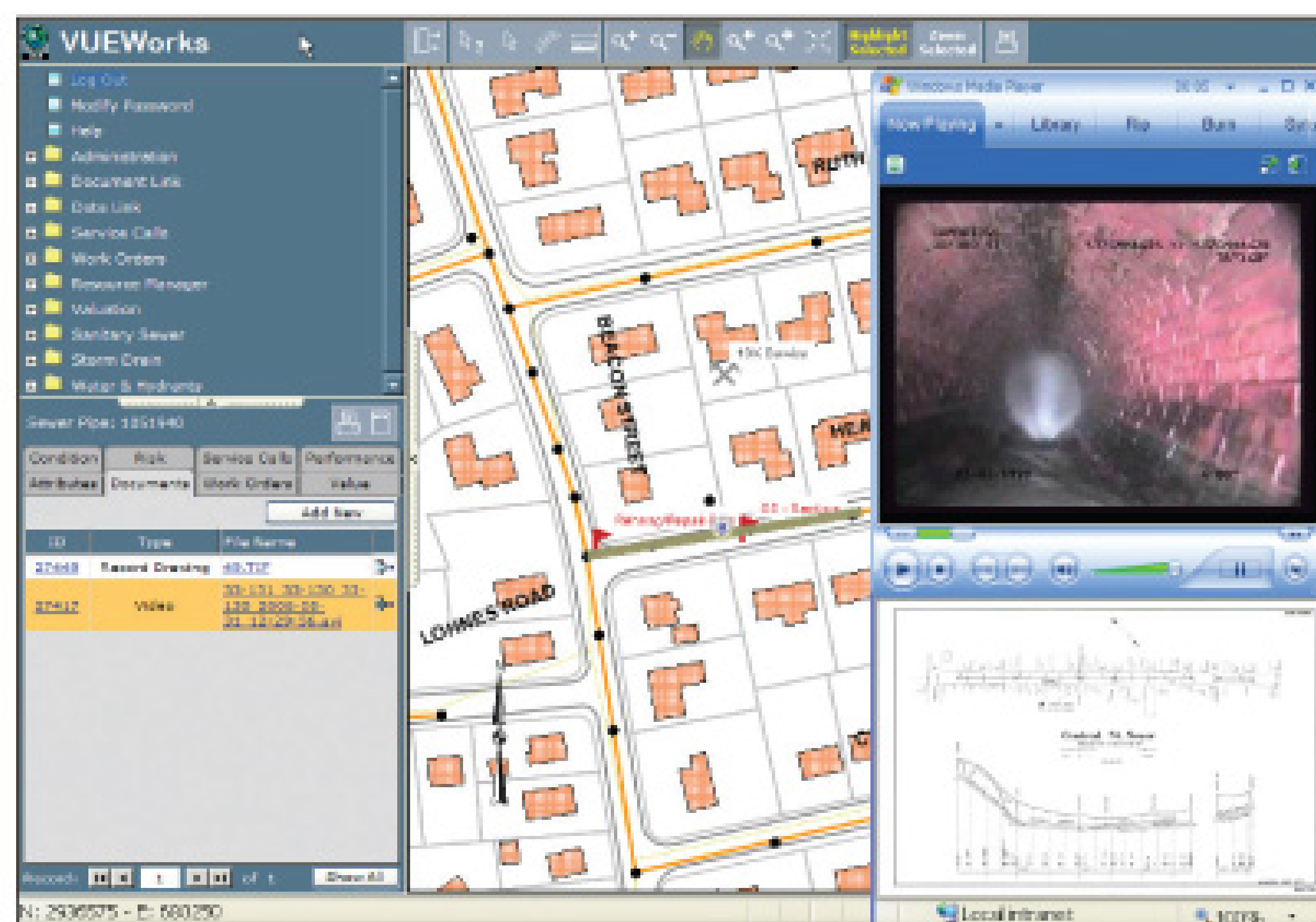
Spalding concluded the demonstration with a brief review of how the software can assist in calculating risk assessment for particular system components and capital

expenditures for repair projects. For operators in the field, the software can be set up to produce prompts for users to enter information about various conditions of an asset.

VUEWorks also prompts the operator to enter information about projected risks assigned to a component, enabling rapid calculation of such things as the impact of a failure in a particular part of the system. Another module includes prompts and data entry fields that can be used to calculate repair costs for a component, assign equipment and supplies for a repair job (if they are logged into inventory databases that can be accessed via VUEWorks), and project various kinds of budgetary scenarios.

#### Observer comments

The visual nature and the



**FIGURE 5.** Documents like as-builts and record drawings (lower right) and video inspections (upper right) can be linked to an asset such as this sewer line, shown in the Map View (center).

familiar look of VUEWorks makes it appear easy to use and learn intuitively. Indeed, the complex discussion of how it works, complete with rapid-fire reference to various kinds of computer-software terminology not readily known by many average users, may make it more intimidating at first than simply picking up a keyboard and mouse and poking through the system.

#### Manufacturer comments

The modular structure of the software allows purchasers to start out with the Core system and expand as needed. The Core system allows users to load GIS-based asset data and use a map interface to focus on assets or parcels within the user's purview; link electronic documents including photographs, drawings, plans, permits, forms and other information to assets or map features; move, add or delete assets; and link to other databases, von Svoboda explains.

Additional modules can enable more sophisticated and complex tasks, from managing work crews to assessing capital costs or assessing the risks to infrastructure components. They include the Resource Manager, which enables

a range of tasks associated with tracking and administering work orders, such as assigning personnel and equipment, calculating work costs, notifying crews of work order assignment, adjusting inventory supplies, and configuring work flow. Other specialized modules are designed for water, sewer and stormwater collection systems.

"A lot of people want to start out with the Core, Service Call, Work Order and maybe Resource Manager modules," von Svoboda says. "Later, they may go higher with risk assessment and evaluation modules."

Because VUEWorks typically resides on a central server and is accessed via a browser, it is not licensed based on how many machines it is installed on, but rather on the basis of how many authorized users it has. ♦

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An inspection technician lowers a camera on a float rig into a mainline sewer. (Photography by Jim Aanderud)

# PLAYING THE FLOAT

At high flows in large-diameter pipes, boat or pontoon platforms provide an alternative for performing top-quality video inspections

*By Jim Aanderud*

Cities and sewerage agencies often collect wastewater from large areas that must be conveyed to distant treatment plants. Handling this enormous volume requires large-diameter trunk lines.

It is not unusual to find trunk lines more than 100 inches in diameter. Because these lines carry such large flows, they often run well above the half-pipe and at more than 10 feet per second. This often prevents the use of standard camera crawlers for CCTV inspection.

Most inspection equipment manufacturers offer crawlers designed for large-diameter pipes. As water level increases, these crawlers have remote-controlled elevators, or scissor lifts, that raise the camera 1 to 3 feet. Usually, that is enough to keep the camera above water. But once the level exceeds the height to which a camera can be raised, an alternative method of inspection is needed. This is where floating platforms come into play.

## Riding the surface

A floating platform (float) is a boat or pontoon on which a camera is placed. The float with camera is then pulled through the pipeline. This allows the camera to traverse the pipeline even when the water level is more than 3 feet high.

One disadvantage of this method is that the bottom of the pipe — the area below the water line — is not visible. However, with experience, an operator can learn to read turbulence in the line and determine where problems exist. Conversely, the floating platform is highly effective for inspecting the upper portion — or crown — of the pipe. The information from that alone can make this type of inspection worthwhile.

The Sanitation Districts of Los Angeles County, for example, operate a vast sewer system of large-diameter reinforced concrete pipe (RCP) lines. The primary concern is the crown



**A camera on a float proceeds down a mainline under heavy flow. Floats enable high-quality inspections under conditions where a traditional camera crawler cannot be used.**

of the pipe, where hydrogen sulfide eats away at the cement and exposes the aggregate and rebar. CCTV inspections record the deterioration progress so that the districts can set mitigation priorities. In most cases, floating platforms are the only way to look at these pipes because they carry high volumes 24 hours per day.

Although some manufacturers fabricate floats, many contractors and agencies choose to construct their own. Any style is fine, as long as it is buoyant enough to support the weight of the camera.





**A camera float rig is shown ready for deployment. Floats can be tethered from the upstream manhole only or from both ends.**

Since a mainline camera is being used, all of the attributes of a standard pipeline inspection hold true. Operators can still scan and zoom in on points of interest while recording the inspection. The result is a high-quality inspection of the pipe crowns. In the largest lines, a standard inspection camera may not provide sufficient light. In this case, auxiliary lighting may need to be part of the custom float design.

The process of floating a pipeline can be quite involved. Most likely, the job will require additional personnel, and setups may take much longer than for a standard inspection. On the other hand, it may also be possible to inspect longer reaches where only the length of the cable is the limiting factor.

### **Working downstream**

There are two methods for inspecting pipelines with floating platforms. The first is quicker to perform, but also carries more risk. Here, the CCTV vehicle sets up at the upstream manhole. The float is then tethered from the rear as it travels downstream through the pipeline. A small parachute can be placed in front of the float, with 20 to 30 feet of rope, to give the float added propulsion.

Some float crews use only the CCTV cable as a tether, but that can be very risky. If the cable or

connector breaks, the camera and float could be lost. A safer approach (although more cumbersome) is to use an additional rope or cable attached to a winch as a safety line.

In this method, the propulsion for the float comes exclusively from the flow in the line. If the flow is slow or stagnant, this method may not work well. On the other hand, if there is a significant flow, holding back the float to get good data can be a real challenge.

Movement of the float is controlled with the cable winch. The operator inspecting the line must communicate the platform's speed and movement to the person controlling the winch. This requires a team effort to produce a quality inspection.

As the float travels down the pipe, the cable or cables will become heavy, and the float will slow down. At some point, it may need additional propulsion. One effective way to increase velocity is to attach more parachutes.

If prefabricated parachutes are not available, they can be made out of tarps, heavy-duty garbage bags or even 1-gallon plastic bottles. These items must be connected at all corners to a rope, which is then tied around the cable and allowed to float down the line. Once the parachute reaches the float, it engages and provides added power. More than one parachute may be needed, especially on runs longer than 1,500 feet.

For retrieval, heavy flow in the line makes it nearly impossible to pull the float and camera backward. For this reason, the float needs to be

**One disadvantage of this method is that the bottom of the pipe — the area below the water line — is not visible. Conversely, the floating platform is highly effective for inspecting the upper portion — or crown — of the pipe. The information from that alone can make this type of inspection worthwhile.**

removed at the downstream manhole. A pole with a hook on the end, or a rope with a grappling hook, can be used to retrieve the float once the parachutes are visible.

It is important not to let the float travel past the manhole, as that makes retrieval difficult. Once the hook grasps the rope and parachute, it can be pulled to the surface. This may require a lot of muscle, and the camera can become dislodged or damaged. Use of a confined-space tripod can minimize this effort considerably. Once the float and camera have been removed, the cables are disconnected and pulled back with the winch.

Inserting the float into the water can be tricky, especially in the beginning. Once the float hits the water, it wants to take off, and it may have a tendency to flip over. Patience, practice and experience simplify the process

over time. It is critical to use a safety tension release line to keep tension off of the main cable during insertion. This is another argument in favor of a backup safety line.

Removing the float can easily damage the camera. As the flow pulls against the float, it becomes difficult to manage. Since there is so much pull on it, only brute force can remove the float from the water flow. As the crew pulls up on the cables, the camera will tend to hit the crown of the downstream pipe. Every effort should be made to flip the float over and expose its underside — rather than the camera — to contact with the pipe.

### **Two-end tether**

A second and perhaps more widely used method is to tether the float on both ends. This means the float is connected to the CCTV vehicle at the upstream manhole and is also connected at the downstream manhole. This method provides the most security and stability.

In this case, a cable is first strung from manhole to manhole. This can be done by tying the end of the line to a plastic 1-gallon milk jug one-third filled with water and letting it float downstream. Once the line reaches the downstream manhole, it can be retrieved with a hook on a pole or a rope with a grappling hook.

Sometimes it is easier to float a light line first, such as fishing line, and then use that to pull the heavier line through. Either way, the line must be strong enough to pull the float and to provide enough strength if the other line breaks.

Obviously, this method requires someone at each manhole. While the winch lets out cable at the CCTV vehicle, cable is reeled in at the downstream manhole. Personnel on each end must be in continuous radio contact. Having the float tethered on both ends not only provides additional security — it also provides

the needed propulsion. For this reason, this method can be used where the water flow is nearly stagnant.

As metropolitan populations continue to grow, so will the need for large-diameter trunk lines. Because diverting flow from these lines for inspection is cost-prohibitive, proper assessment requires some type of floating CCTV inspection. Eventually, more technologically advanced floats will be developed, but the basic concept of placing a camera on a floating platform will be around for decades to come.

Jim Aanderud is owner of Innerline Engineering, a video pipeline inspection company based in Corona, Calif. ♦

# AN EXCITING YEAR

Successful NASSCO testimony on OSHA's proposed confined-space regulations helps save members and the industry millions of dollars

By Irvin Gemora

I paused when I sat down to write this final column of the year. While I have much to share about the year ahead, I felt compelled to reflect on all that's happened in 2008 at our growing organization. In my 20-plus years with this organization, I've never seen a more productive year. Here are just a few of the many highlights:

- We updated our image with new branding and a new Web site.
- Our new offices provide space for demonstrations, training and education.
- Grout boot camp in the new office space brought competitors together.
- We signed a record number of new members.
- We introduced TAG-R — an industry-first.
- We announced a new Inspector Training and Certification Program for CIPP.
- PACP became the industry standard in Quebec Province.
- We provided seed money for the "Liquid Assets" program that educates consumers about our industry.

The accomplishment I would like to highlight most is our impact on the OSHA Hearing on the Proposed Rules Changes for Confined Spaces Regulations, held in Washington, D.C., in July. Proactive outreach by NASSCO at this hearing helped save our members and our entire industry millions of dollars.

Given the significant impact the proposed changes could have with regard to assessing conditions, complying with the new regulations, and the cost to comply, we invested in legal counsel to help in this matter. NASSCO has been following this issue for months and was one of the leading organizations to voice concerns.

Additionally, to prepare for our testimony, I surveyed members and learned that our 350 members (whose employees total nearly 35,000 people) open 4 million manholes per year, and members send a technician down a manhole more than 2,700 times per day.

Why are these statistics important? Because I wanted to show that we're working safely under the current rules. The number of OSHA-reportable incidents experienced by our members is under 0.01 percent for the past three years. I also wanted to demonstrate the financial impact the changes would have on our industry. In fact, we calculated that the proposed rule would cost NASSCO members \$7.5 million annually.

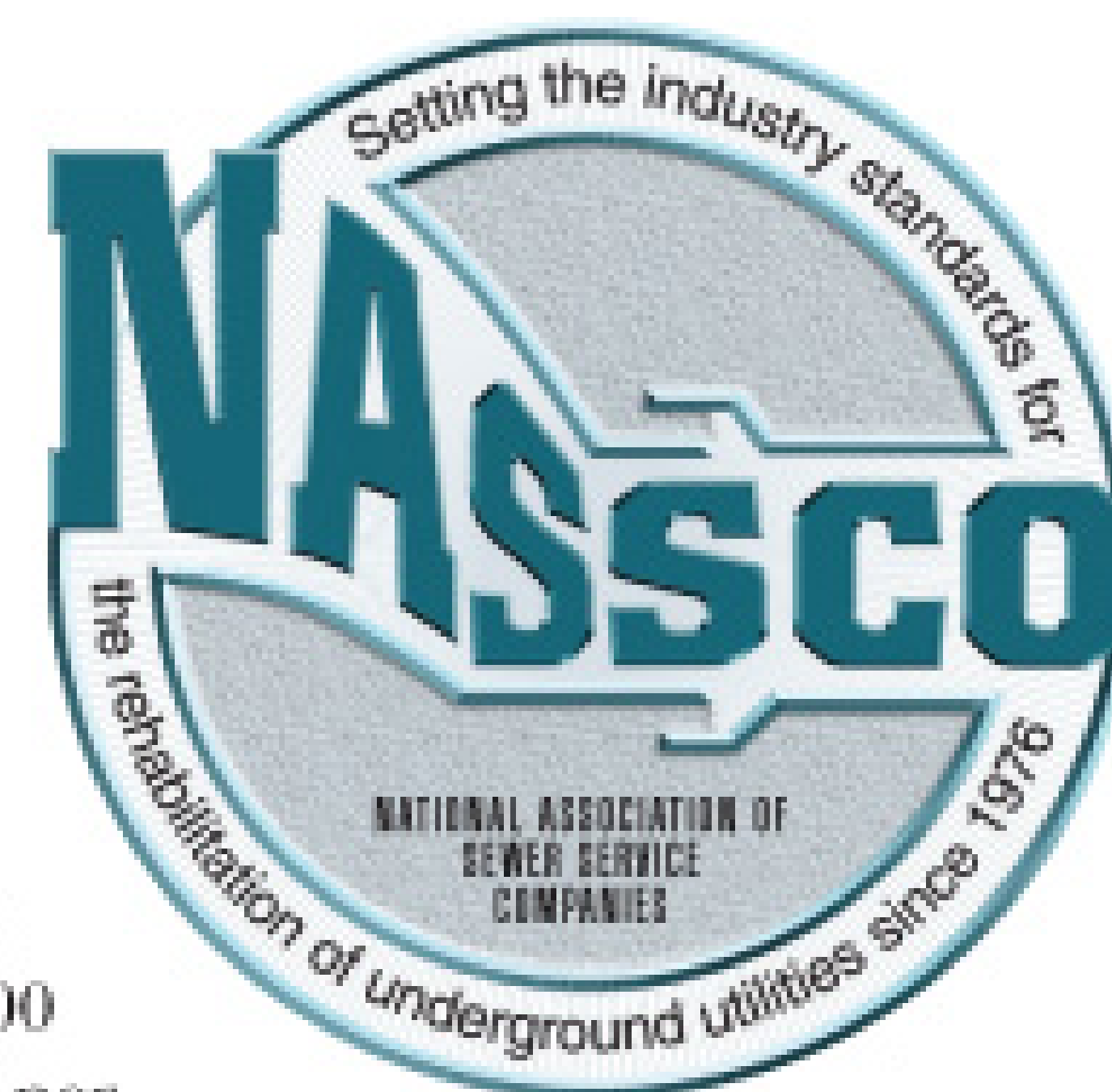
NASSCO was the only trade association in attendance that represented the pipeline rehabilitation industry. Representatives of other industries, such as road building, water tower construction and home building, were present and testified. NUCA members were well represented as installers of new pipe systems.

NASSCO testimony was presented by Kathy Romans, board member, officer and chair of the Health and Safety Committee. Earlier meetings with our legal counsel helped prepare us for the hearing. We received on-the-record statements that if the regulations are issued, OSHA will continue to classify the majority of the work conducted by our members as maintenance work and therefore exempt from the construction regulations.

NASSCO members safely enter and work in thousands of confined spaces every day. Confined-space safety is clearly a priority, and we're committed to working with OSHA to improve the safety and health of the confined-space work environment.

I'm thrilled to have had another year with NASSCO, and I'm even more excited about the year ahead. If you're not already a member, I invite you to join us. Learn more at [www.nassco.org](http://www.nassco.org) or contact Andrea Carter at [andrea@nassco.org](mailto:andrea@nassco.org) or 410/486-3500. ♦

Irvin Gemora is executive director of NASSCO. He can be reached at [director@nassco.org](mailto:director@nassco.org). The NASSCO headquarters is at 11521 Cronridge Dr., Suite J, Owings Mills, MD 21117.



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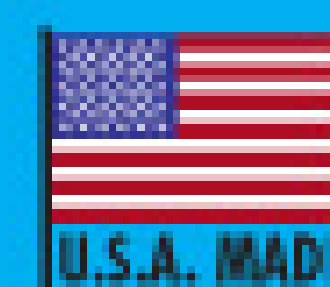


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# NOT SO FAST

A new book encourages employers to think about steps they might take to keep older people happy at work and forestall a loss of talent to retirements

By Ted J. Rulseh

**T**he problem: Employers, including public agencies, face the loss of many workers as the baby boom generation reaches retirement age. The solution: Encourage those baby boomers to stay on the job longer.

That's the premise behind a new book, *Working Longer: New Strategies for Managing, Training, and Retaining Older Employees*, published by the American Management Association.

Bureau of Labor Statistics figures show that by 2012, workers 55 and older will make up about 19 percent of the labor force, versus 14 percent in 2002. Many employers' first reaction is to gear up recruiting and succession planning to replace those who retire. An equally sound response may be to motivate, nurture and train those older workers so that they want to stay on board.

## Missing the moon

Authors William J. Rothwell, Harvey L. Sterns, Diane Spokus and Joel M. Reaser mention the knowledge that goes out the door when older workers leave.

"[W]hen the President proposed sending a man to the moon again, few people mentioned the simple and startling fact that the U.S. space agency has forgotten how to get there," they write. "That's because in the 1990s NASA underwent a period of cost-cutting and downsizing that encouraged

the engineers who designed the space program to take early retirement."

They cite a study by the Society for Human Resource Management showing that:

- 59 percent of companies do not recruit older workers.
- 65 percent of companies have no retention practices.
- 71 percent of companies have no specific provisions or benefits for older workers.

And yet, according to U.S. Comptroller General David Walker, U.S. workers are healthier and living longer, studies show that many want to extend their careers, and older workers have experience and key skills that can be difficult to replace.

## Tackling stereotypes

The book also shoots arrows at various stereotypes that make many employers resist hiring or retaining older people instead of bringing younger people on. It includes a series of myths and facts cited by AARP. For example:

**Myth:** You can't teach an old dog new tricks.

**Reality:** Studies show only negligible cognitive loss in people under 70.

**Myth:** Training older people is a lost investment because they will not stay on the job for long.

**Reality:** The future work life of an employee over 50 usually exceeds the life of the technology for which the workers are trained.

**Myth:** Older workers are not as productive as younger workers.

**Reality:** Overall productivity does not decline as a function of age. Productivity can actually rise due to greater worker accuracy, dependability and capacity to make better on-the-spot judgments.

The authors don't dodge the differences between older and younger people, but they insist that workplaces can be made more friendly to older workers without great expense or difficulty. For example, it might be necessary to consider workplace designs that account for older workers' vision, hearing and mobility issues, and to create more comfortable ergonomic workstations.

## The need for training

Beyond physical accommodation, older workers may need to be trained for new tasks or responsibilities that will help keep them interested and energized so more are willing to stay on the job.

The authors identify seven areas to consider in designing training:

**Motivation.** Older people are less likely than others to volunteer for training because they fear failure or comparing poorly with younger workers. "Trainers can help alleviate feelings of fear or inadequacy by providing continuous positive feedback and reminders of training goals," the authors write.

**Structure.** Training should be relevant to the job, and exercises

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

should be arranged in order from simpler to more complex.

**Familiarity.** Training programs should build on participants' past knowledge and current abilities when possible. Use of examples increases participants' attention.

**Organization.** "[T]rainers should organize the material being presented to help retention and comprehension by placing material into meaningful groupings. Teaching older trainees to organize what they learn is another effective option in training."

**Time.** Slower presentation and longer study and test periods help older workers. "Given sufficient time, older learners perform as well or better than younger learners. Self-paced learning for older workers is optimal."

**Active participation.** Older learners may struggle with lecture or rote memorization formats. "Active participation builds self-confidence and reduces cautiousness and hesitancy."

**Learning strategies.** Some older people may need to be taught strategies on how to learn — tactics such as outlining or creating categories.

## Answers close to home?

*Working Longer* provides food for thought for municipal departments expecting to lose valued workers to retirement. Readers may find solutions to the problem of departing baby boomers closer to home than they thought possible. ♦





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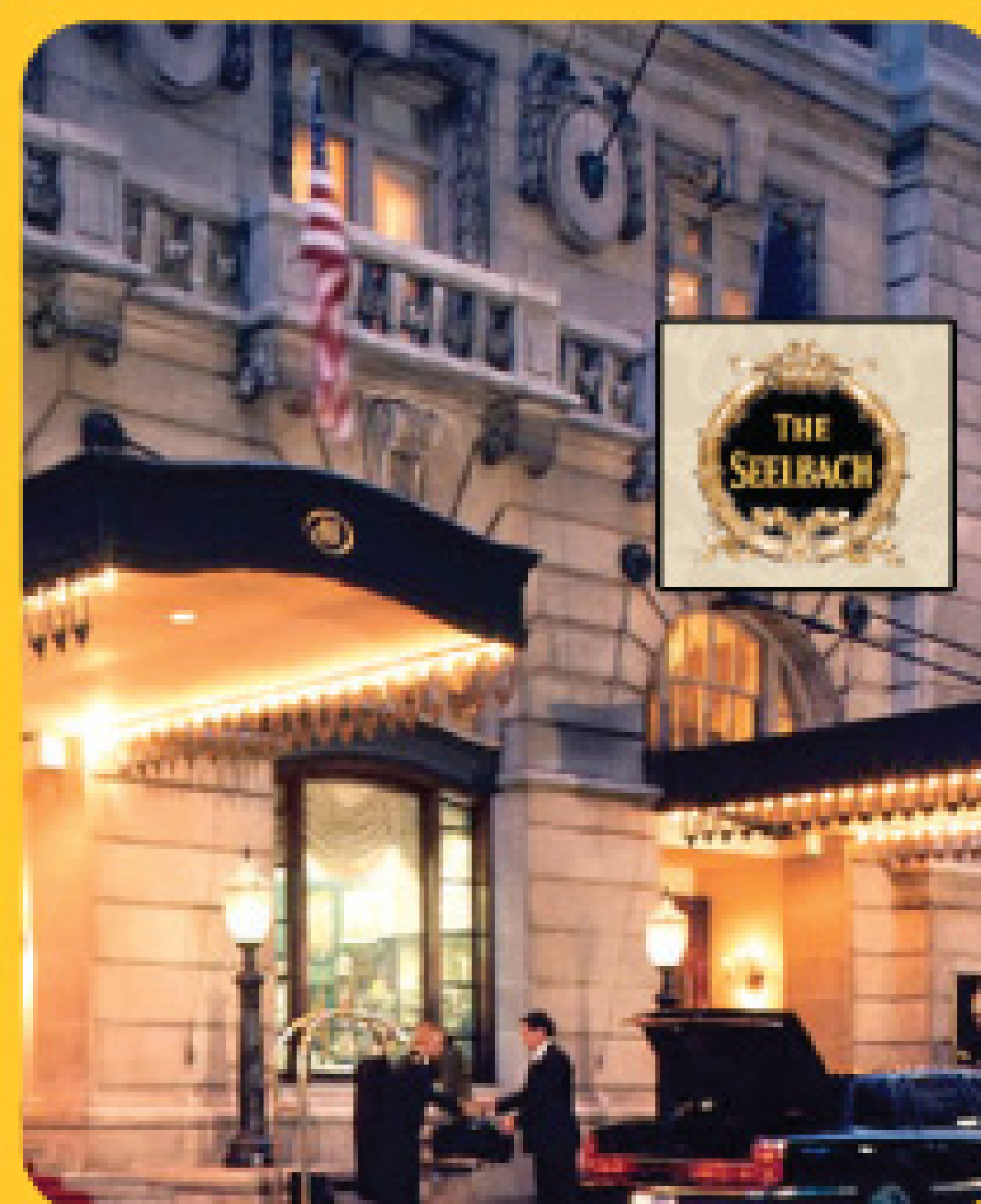
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Most official Expo hotels have shuttle bus service to the Expo hall. Please refer to the website for details.





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# EDUCATION DAY

**Wednesday**  
February 25th, 2009

- Full day of seminars
- Exhibit hall closed
- Schedule subject to change

ROOM C201 & C202

**LRN** Leaders Resource Network

8:00 - 9:00	How to Become a Value Leader
9:30 - 10:30	Credit Collections: Getting Paid
11:00 - 12:00	The Value of Internet Marketing
12:00 - 1:00	<b>Lunch Break</b>
1:00 - 2:00	Selling Value
2:30 - 3:30	How to Add Value to Every Customer You Have and Future Customers
4:00 - 5:00	How to Determine Your Operating Costs

ROOM C203

**WJTA / PSAI / CBSA**

8:00 - 9:00	What an Air Mover Can Do For You
9:30 - 10:30	The Basics of High Pressure Waterblasting
11:00 - 12:00	Waterjetting Applications
12:00 - 1:00	<b>Lunch Break</b>
1:00 - 3:30	Understanding Your Cost to Insure Profitability (PSAI)
4:00 - 5:00	Cross Bores of Gas Lines in Sewers (CBSA)

ROOM C204 & C205

**SSCSC** Southern Section Collection Systems Committee

8:00 - 9:00	Trenchless Pipe Rehabilitation
9:30 - 10:30	CCTV Pipeline Inspections
11:00 - 12:00	The Nuts and Bolts of GIS
12:00 - 1:00	<b>Lunch Break</b>
1:00 - 2:00	The Nitty-Gritty on Pipeline Cleaning
2:30 - 3:30	Confined Space and Protective Equipment Safety Requirements
4:00 - 5:00	Manhole Inspections

ROOM B101 & B102

**NAWT** National Association of Wastewater Transporters

8:00 - 9:00	What are My Disposal Resources
9:30 - 10:30	Treatment Processes, What is Out There?
11:00 - 12:00	Evaluating Costs as Part of the Decision Making Process
12:00 - 1:00	<b>Lunch Break</b>
1:00 - 2:00	Meeting Part 503 Requirements
2:30 - 3:30	Turn Grease Trap Waste Into Gold
4:00 - 5:00	Developing a Business Plan

ROOM B103 & B104

**NOWRA** National Onsite Wastewater Recycling Association

8:00 - 9:00	NOWRA Overview & Industry Trends
9:30 - 10:30	Soil & Site Evaluation Overview
11:00 - 12:00	Septic Tanks: Function, Inspection, Installation & Trouble Shooting
12:00 - 1:00	<b>Lunch Break</b>
1:00 - 2:00	Aerobic Treatment Units & Filters
2:30 - 3:30	Pumps & Controls
4:00 - 5:00	Operation & Maintenance of Systems

ROOM C101 - C104

**NASSCO** National Association of Sewer Service Companies

8:00 - 9:00	Robotics For the Future, What Does it Mean for You?
9:30 - 10:30	Small Diameter Epoxy Coatings
11:00 - 12:00	Root Control, How Does it Work and Why is it Needed?
12:00 - 1:00	<b>Lunch Break</b>
1:00 - 2:00	OSHA Regulations
2:30 - 3:30	Choosing the Correct Chemical Grouts
4:00 - 5:00	Trained Technology Inspectors

ROOM C105 - C108

**NEHA** National Environmental Health Association

8:00 - 9:00	How to Work With Regulators and Regulations
9:30 - 10:30	Pumpers: Operation & Maintenance
11:00 - 12:00	Routine Maintenance Inspections
12:00 - 1:00	<b>Lunch Break</b>
1:00 - 2:00	Using the Certified Installer Credential to Help Your Business
2:30 - 3:30	T.B.D.
4:00 - 5:00	T.B.D.

ROOM C109 - C112

**SCOTT HUNTER** Business Track

8:00 - 9:00	The Art of Personal Sales
11:00 - 12:00	The Art of Personal Sales (Part 2)
12:00 - 1:00	<b>Lunch Break</b>
1:00 - 2:00	Yes, We Have to Work Together, but Does it Have to be So Painful?
4:00 - 5:00	The Art of Being Outrageously Successful!



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## THURSDAY

February 26th, 2009

ROOM C101-C104

### Portable Toilet Track

- 8:00 - 9:00 Portable Sanitation Start Up  
**Hampel**
- 9:30 - 10:30 Selling Portable Restrooms Services  
**Satellite Industries**
- 11:00 - 12:00 T.B.D.

ROOM C105 - C108

### Liquid Waste Track

- 8:00 - 9:00 Decentralized Wastewater Sustainability - **Aquatest**
- 9:30 - 10:30 Discover the "GREEN ERA" and capitalize on it! - **Lenzyme**
- 11:00 - 12:00 Modular Waste Water Treatment  
**Big Fish Environmental, LLC**

ROOM B103 & B104

### Municipal Track

- 8:00 - 9:00 Why Measure Sewer Flows from Private Services? - **City Meter**
- 9:30 - 10:30 Polymer Solutions for Wastewater Treatment - **Fort Bend Services**
- 11:00 - 12:00 Rotary Jets for Material Removal  
**StoneAge**

ROOM C109 - C112

### Sewer & Drain Track

- 8:00 - 9:00 Bacteria Mythbusters -  
**ProClean by Durable**
- 9:30 - 10:30 Solutions for Nineteenth Century Manholes - **AP/M Permaform**
- 11:00 - 12:00 Manholes & Leakage Solutions  
**Sealing Systems**

## FRIDAY

February 27th, 2009

ROOM B101 & B102

### Sewer Cleaning Track

- 8:00 - 9:00 High Pressure Hose Safety & Proper Use  
**Spir Star**
- 9:30 - 10:30 The Better Jetter, Secrets to Jetting  
**US Jetting**
- 11:00 - 12:00 Chemical Root Control  
**Douglas Products**

ROOM B103 & B104

### Business Track

- 8:00 - 9:00 Maintenance Agreements for Commercial Accounts  
**Spartan Tool**
- 9:30 - 10:30 First Rate Customer Service  
**RooterMan**
- 11:00 - 12:00 Insurance and Risk Management  
**Heffernan Insurance**

ROOM C101-C104

### Miscellaneous Track

- 8:00 - 9:00 Keys to Proper Power Take-Off  
**Muncie Power Products**
- 9:30 - 10:30 Vacuum Tank, Chassis and Pumps  
**Amthor International**
- 11:00 - 12:00 Lateral Replacement Program  
**TT Technology**



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# Product Spotlight

## Automated System Speeds Hydrant Flow Testing

By Ken Wysocky

The Fire Flow Pro system from Hurco Technologies Inc. quickly and accurately tests, records and manages critical fire-flow data for fire hydrants.

Traditional hydrant testing requires two workers and takes about an hour per hydrant. The Fire Flow Pro requires one operator because it uses wireless technology to transmit data from the test hydrant, notes Lynn Hurley, Hurco president.

"You can do at least six hydrants per hour instead of one, and you need only one person to do it," he says. "If a city has 10,000 fire hydrants, you don't want to take an hour per hydrant for testing."

The system automatically captures critical data, such as location, static pressure, residual pressure, predicted flow at 20 psi, total gpm, total gallons used in the test and NFPA classification that workers can later download onto a computer. This eliminates manual data entry and calculation.

"There's no need to go back to the office and run numbers," Hurley says. "You record all the data on the computer by just hitting the 'Save' button." The system records each hydrant's GPS coordinates, which can be entered onto a municipal GIS map, making it easier for firefighters to locate hydrants.

Because the actual testing takes seconds, municipalities can save tens of thousands of gallons of water per year. The system accurately demonstrates which hydrants meet NFPA water flow standards and provides insurance companies with verifiable hydrant data.

Municipalities can use the system to perform regular spring and fall hydrant flushing and hydrant tests at the same time. 800/888-1436; [www.hurcotech.com](http://www.hurcotech.com); Expo booth 41.



**Fire Flow Pro**  
from Hurco  
Technologies Inc.



## General Rolls Out Gen-Ear LE Leak Locator

The Gen-Ear LE leak locator from General Pipe Cleaners fits in the palm of the hand and provides noise-free amplification with built-in preset audio filters that block out surrounding ambient





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noise. The system is designed to pinpoint water leaks in residential and commercial water lines, whether they are under concrete, in walls, swimming pools or hot tubs. 800/245-6200; [www.generalpipecleaners.com](http://www.generalpipecleaners.com); Expo booth 3147.

## Electric Eel Offers Color Mini-Camera System

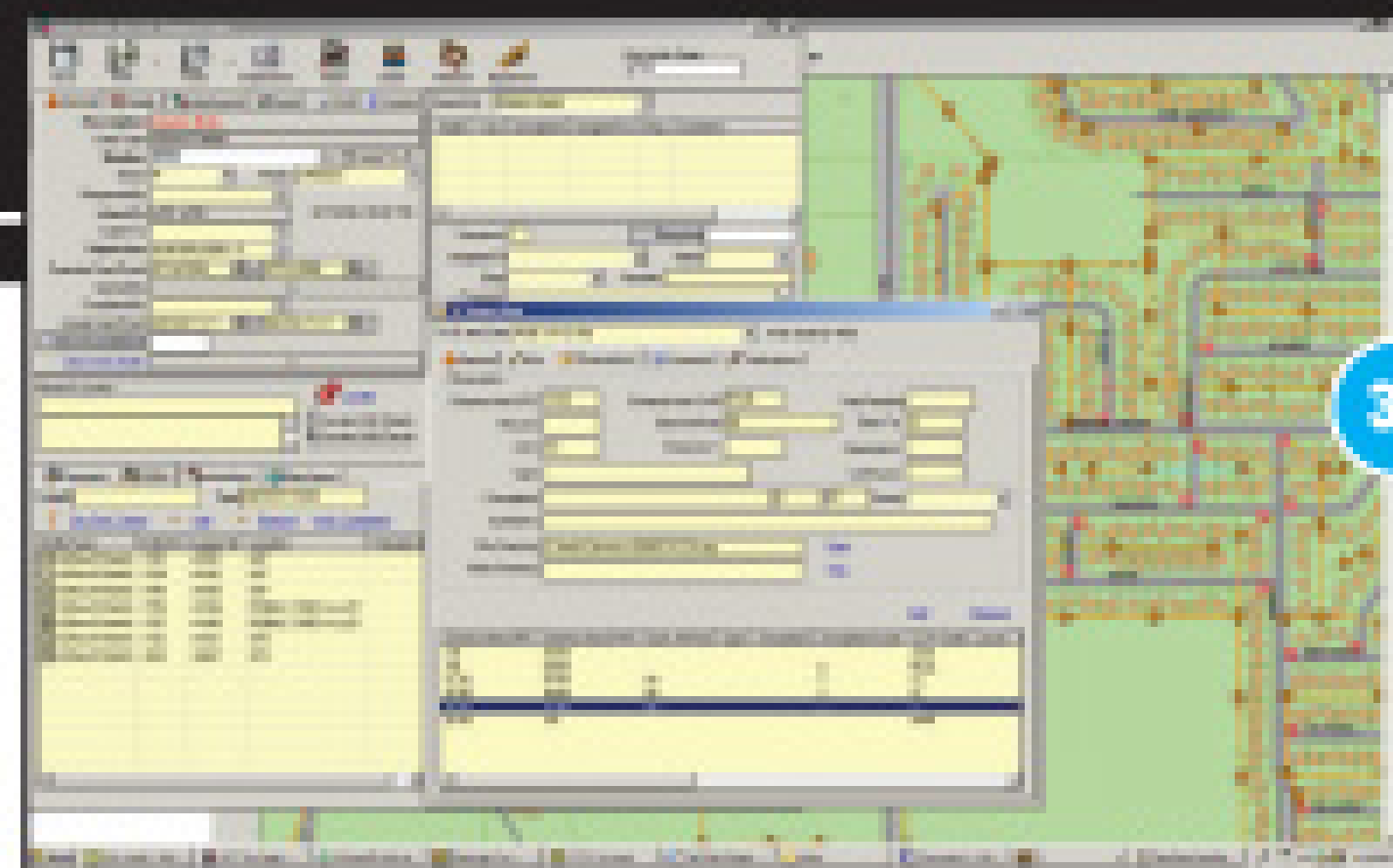
The EC-5 mini color camera drain line inspection system from Electric Eel features a 5-inch LCD color monitor, color camera, 100 feet of push cable and a 512-Hz inline transmitter housed in a lightweight, portable reel. A self-leveling camera is available. The camera system is designed to inspect 2-inch through 8-inch drain lines and weighs 25 pounds. Jacks are provided for an external recording device. 800/833-1212; [www.electriceel.com](http://www.electriceel.com); Expo booth 169.



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## PipeLogix Offers Cityworks Interface

Version 6.2.7 of PipeLogix's flexidata pipe survey software offers a direct interface to Cityworks' asset management software, with import/export functions in PACP mode. Work orders created in Cityworks can be imported as a project into flexidata. Once surveys are created with manhole numbers and pipe and location details, data can be exported back into Cityworks. 760/779-1700; [www.flexi-data.com](http://www.flexi-data.com); Expo booth 158.

## MyTana Introduces DCB 10 Digital Video System

The DCB 10 digital monitor/video recording system from MyTana Manufacturing Co.y Inc. features a 12.1-inch touch screen, full text writing ability, and various media output, as well as 11 onscreen touch-and-drag icons for locating and identifying problem areas. The pipeline inspection system can be operated using either battery power or AC current. Controls can be accessed onscreen using the stylus. Common obstruction icons are preloaded and can be dragged onto the inspection image. 800/328-8170; [www.mytana.com](http://www.mytana.com); Expo booth 8089. ♦



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- ▶ Locators
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- ▶ Pipe Bursting Equipment
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- ▶ Pumps - Submersible
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**1997 Ford Aquatech B-10:** Eaton Fuller 8 spd., Cummins 6 cyl., Roots blower, 80 gpm @ 2000 psi., 12-cy tank, 52,000 GVW. \$55,000. **717-697-6483.** (M12C1)

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## JET VACS

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2000 Vac-Con V350/850 on International 2554 chassis, 109,000 miles, 5-yard debris tank, 3-stage fan, hydrostatic drive, 180 D articulating hose reel, 50 gpm, 3000 psi water pump. \$75,000. Contact Julio Cisneros 623-980-8063. (CPT12)

CAMELS: 2008 Camel 200 DEMO unit, only 8,500 miles+/- Like new with Cat Diesel, Sterling tandem chassis, 10 cy dump, front reel mount, winter circulation and vacuum excavating packages, never titled. 1997 Camel 200 on Ford LT8515 tandem chassis. One owner truck with only 67,000 miles, Cummins 275 Diesel, auto shift, 10 cy dump body and behind the cab reel. 1990 Camel 200 on a Ford LNT 8000 chassis w/a Ford Diesel, auto shift, 10 cy body, front reel and only 42,000 miles, municipal owner. Check website [www.ziamunicipal.com](http://www.ziamunicipal.com) for more information or call 614-419-4579. (CP2)

1998 Vac-Con Model V350THA, 3-stage fan, 50 gpm, 3000 psi pump, 5-yd. debris tank, new white paint. Was city owned. 714-639-8352. [www.empireequip.com](http://www.empireequip.com). (CPBM)

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**920-925-3537**

P11CM12



**2000 Sterling, Vac-Con V311:** 3126 Cat, Cummins 3.9 Turbo Upper, Allison Auto., 20 Front, 40 Rears, 23,470 Miles, 3,309 Hrs. Vac Unit, 611 Hrs. Jetter.....\$79,900  
**814-696-4343 - Hollidaysburg, PA** CMP12



**1994 Vac-Con:** Ford L8000, 103,923 miles, auto. trans., 3-stage fan blower, hydrostatic, FMC water pump @ 45 gal. @ 2000 psi. ....\$59,500

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PM12C1



**1997 Ford:** 300 hp w/Supersucker, 17" HG 1020 blower, wet/dry.

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**For More information,  
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CMP12



**1994 Vac-Con Hi-Rail Vacuum Truck:** 5016 Series. 16 cu. yds., wet or dry. Roots 1024 blower, 18" HG. DMF hi-rail setup. Remote controlled hydrostatic rail drive. Rebuilt hydrostatic drive February 2007. Repainted white 2006. ....\$100,000 OBO

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**2004 Vactor 2112:** 12-yd. debris body, 8' hyd. boom, telescopic rotating hose reel, centrifugal separator. Mounted on a 2004 Freightliner, 300 hp, automatic. Financing available. (Stk #0808C1)

**Call Joe 312-208-6373**

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**1994 Vactor GMC White Cabover:** Cummins 6 cylinder x2, 1,000 gallons, 5 yards, dual fans, excellent condition.

.....\$70,000 OBO

**Contact Bill at 1-866-744-9921**

CP12



**1990 Ford L-8000 Aquatech Jet Truck:** 65 gpm @ 2000 psi, 2000 gal. water tank, Gaso pump, 450' of 1" hose, arrow board, 19,100 miles, 3,610 hours, very clean, excellent running condition. ....\$25,500

**John or Bob 732-469-6224**

C12

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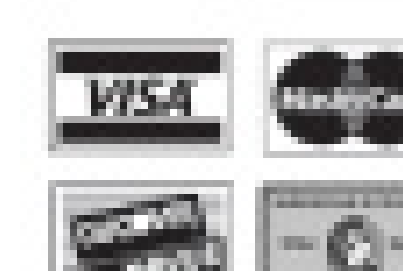
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## PACP Positioned as North American Standard

Since the North American Association of Pipeline Inspectors (NAAPI) ceased operations in September, the NASSCO Pipeline Assessment and Certification Program (PACP) has been positioned as the new standard for North America.

Upon closing its doors, NAAPI referred its members to NASSCO for operator training and certification. NASSCO is preparing for this demand in Canada by securing PACP-certified trainers in each province. Under PACP, operators do not need to be recertified. A QA/QC program within PACP allows contractors and municipalities to monitor the accuracy of each technician and require further training if indicated.

In June, Canada's Center for Expertise and Research on Infrastructures in Urban Areas established PACP as the industry standard in Quebec.

## Overflow Right-to-Know Bill

The U.S. Senate Environment and Public Works Committee passed the Sewage Overflow Community Right-to-Know Act requiring publicly owned treatment works to install a methodology, technology and management program that monitors SSOs, notifies the public and local health agencies when overflows occur, and provides monthly and annual reports to the EPA of all overflows. Congress probably will enact the measure next year. The bill is at <http://thomas.loc.gov/cgi-bin/bdquery/z?d110:s.02080;>.

## NUCA Creates New Position

Kenneth Sommer has filled the newly created position of Director of Chapter Development for the National Utility Contractors Association. Sommer's duties include recruiting members, establishing chapters as legal entities, and coordinating their membership activities, advocacy efforts, programs, events, marketing, communications and general administration. Contact Sommer at 703/358-9300 or e-mail [ken@nuca.com](mailto:ken@nuca.com).

## Water Pollution Control Program Grants

A new rule from the EPA gives \$5.1 million to states with adequate permit fees for administering their National Pollutant Discharge Elimination System (NPDES) programs. The rule encourages states to voluntarily implement adequate fee programs and shift part of the financial burden to those who benefit from the permits. The ruling also allows states to transfer funds to other critical water-quality program activities. The permit fee incentive applies only if federal funding for state water pollution control programs is more than the 2008 level. The rule is in effect for the 2009 grant cycle and beyond. For more information, visit [www.epa.gov/owm/cwfinance/npdes-permit-fee.htm](http://www.epa.gov/owm/cwfinance/npdes-permit-fee.htm).

Municipal Sewer & Water 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).

## CALENDAR

### Dec. 1-5

Water Unifies International Conference, University of California-Irvine. Call 949/824-3425 or visit [www.waterunifies.org](http://www.waterunifies.org).

### Dec. 2-3

Water Environment Research Foundation Research Forum, Marriott Suites on Sand Key, Clearwater Beach, Fla. Call 703/684-2470 or visit [www.werf.org](http://www.werf.org).

### Dec. 9-10

Damage Prevention Conference and Expo, Riviera Hotel and Casino, Las Vegas, Nev. Visit [www.damageprevention.com](http://www.damageprevention.com).

### Jan. 25-27

American Water Works Association Water Resources Symposium: Managing in Times of Change and Uncertainty, Portland, Ore. Call 800/926-7337 or visit [www.awwa.org](http://www.awwa.org).

### Feb. 5-6

Ohio Water Quality & Waste Management Conference, Holiday Inn on Lane, Columbus. Call Dr. Karen Mandl at 614/292-4505 or visit <http://setl.osu.edu>.

### Feb. 12-13

American Water Works Association Research Symposium: Emerging Organic Contaminants, Austin, Texas. Call Linda Moody at 303/347-6201 or visit [www.awwa.org](http://www.awwa.org).

### Feb. 17-20

American Water Works Association/Water Environment Federation Utility Management Conference, Hotel Monteleone, New Orleans, La. Call Linda Moody at 303/347-6201 or visit [www.awwa.org](http://www.awwa.org).

### Feb. 25-28

Pumper & Cleaner Environmental Expo International, Kentucky Exposition Center, Louisville, Ky. Call 800/257-7222 or visit [www.pumpershow.com](http://www.pumpershow.com).

### March 1-4

American Water Works Association Customer Service and Information Technology Conference, Westin Hotel, Charlotte, N.C. Call 800/926-7337 or visit [www.awwa.org](http://www.awwa.org).

### March 4-6

Utility Construction Heavy Equipment Expo, Phoenix Convention Center, Phoenix, Ariz. Call 703/358-9300 or visit [www.nuca.com](http://www.nuca.com).

### May 5-7

Water Environment Federation Technical Exhibition and Conference (WEFTEC), Anchorage, Alaska. Call 800/666-0206 or visit [www.weftec.org](http://www.weftec.org).

## LEARNING OPPORTUNITIES

### Two Manuals from CWP

The Center for Watershed Protection released the final installment of the Urban Subwatershed Restoration Manual Series, *Manual 9: Municipal Pollution Prevention/Good Housekeeping Practices*. It provides how-to guidance on investigating and improving 10 major municipal operations, identifying which of them have the greatest impact on water quality, crafting a strategy to address them, and setting measurable goals. The manual is for smaller NPDES Phase II and unregulated communities.

*Monitoring to Demonstrate Environmental Results: Guidance to Develop Local Stormwater Monitoring Studies Using 6 Example Study Designs* covers scoping, budgeting, staffing needs, equipment and sampling requirements. The manual navigates the complexities of implementing a monitoring pro-

gram, enabling managers to be more confident in their results and get the most out of limited stormwater dollars. The manuals are free downloads at [www.cwp.org](http://www.cwp.org).

### Maine

The Maine Wastewater Control Association and York County Community College in Wells have developed a Certificate of Business Management for Wastewater program. Sessions are Thursdays from 8 a.m. until noon at the college.

- Jan. 8 - Feb. 26 – Technical Skills/Regulatory Compliance
  - March 5 - April 23 – Elective (training or computer skills)
- Call Joan Kiszely at 800/452-8786 or visit [www.mwwca.org](http://www.mwwca.org).



## UW-Madison Engineering Courses

The University of Wisconsin-Madison Department of Engineering Professional Development is offering the following CEU, LU, PDH classes. They are at the Madison campus unless indicated otherwise:

- Jan. 5-9 – Cross-Connection Control and Backflow Prevention (K081)
  - Feb. 12-13 – Fleet Management (K325), Las Vegas, Nev.
- Call 608/262-2061 or visit <http://epdweb.engr.wisc.edu>.

## American Public Works Association

APWA has these courses as Web-based broadcasts:

- Feb. 12 – Successful Models for Rural Water
  - March 12 – Mobile Technology for Public Works Use
  - March 26 – How to Initiate and Implement a Right-of-Way Program
  - April 9 – Continuity of Operations – How to Stay on Top
- Call Carrie Merker at 816/472-6100, ext. 5213, or visit [www.apwa.net](http://www.apwa.net). ♦

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## INDUSTRY NEWS

DECEMBER 2008

### Aries Presents Grout Boot Camp VI

Aries Industries Inc. will present Grout Boot Camp VI, Jan. 13-15, at the Aries Industries Service Center, 1441 S.W. 10th Ave., Unit 202, Pompano Beach, Fla. Featuring training for sewer grouting inspectors and operators of test and sealing systems, the seminar will be led by Dick Schantz, with special training by Avanti, deNeff and Logiball. Technical overview will include understanding sewer lines and infiltration, test and seal system components, component maintenance and repair, lateral and main line packer operation, mixing and optimizing acrylamide grout, urethane grout application and ASTM and NASSCO test and seal standards. For more information, contact Tina Marrese at 800/234-7205, ext. 1415.

### RIDGID Releases Product Catalog

The latest 234-page product catalog from RIDGID features a variety of new products and expanded product information. Helpful tool tips are located throughout. To obtain a copy, call 800/769-7743 or visit [www.ridgid.com](http://www.ridgid.com).

### Mr. Manhole Opens Distribution and Training Center

Mr. Manhole, manufacturer and distributor of manhole replacement tools and materials, has opened its new distribution and training center in Delphos, Ohio. ♦

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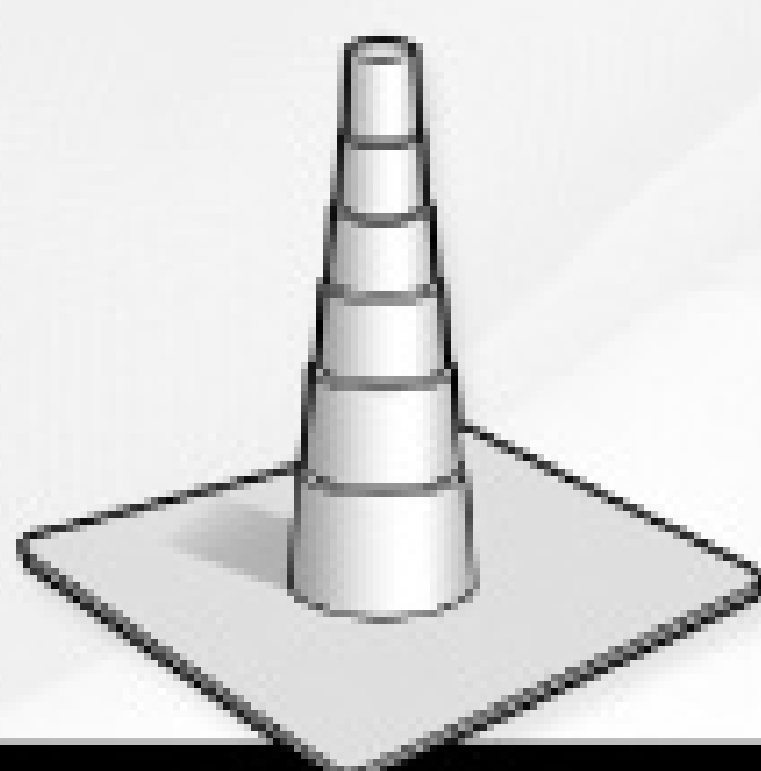
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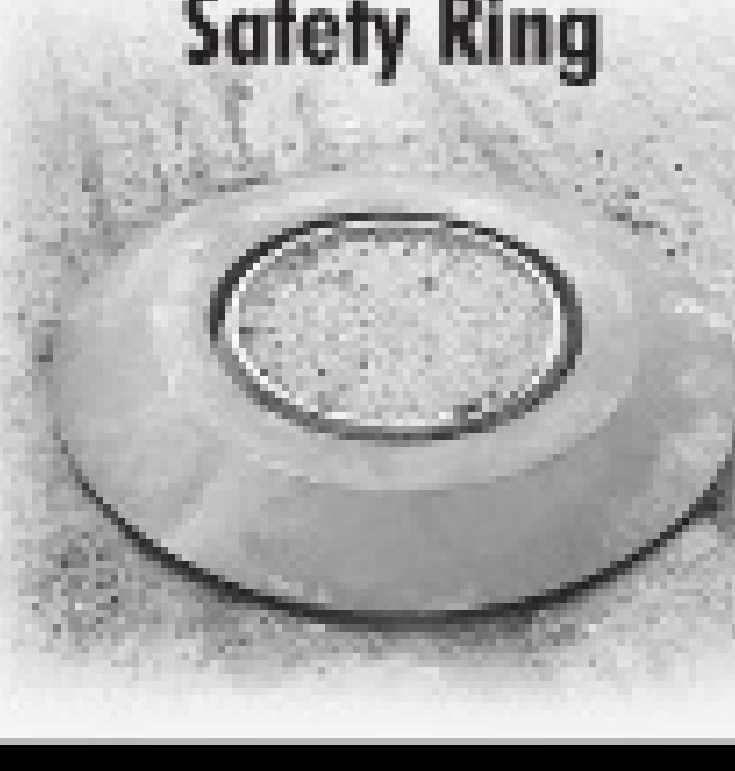
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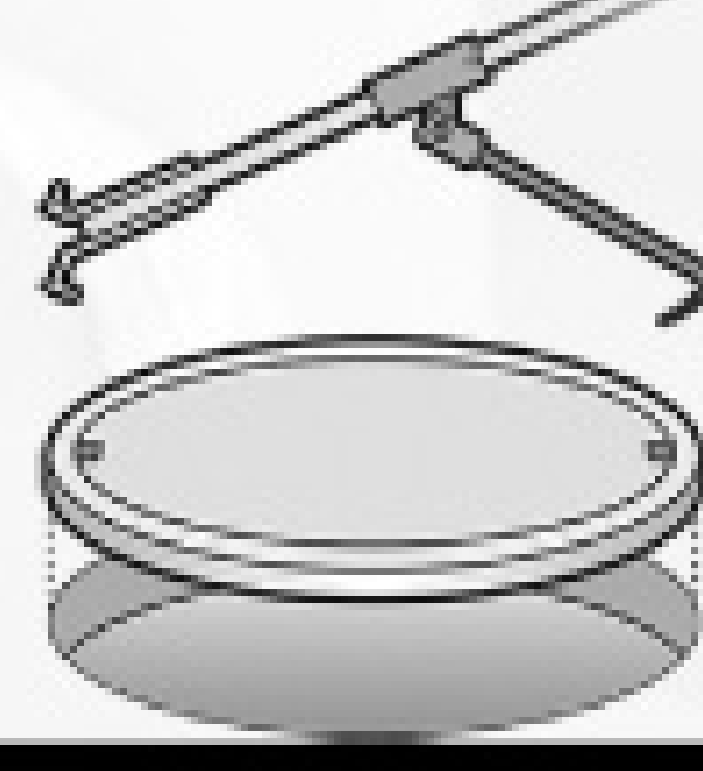
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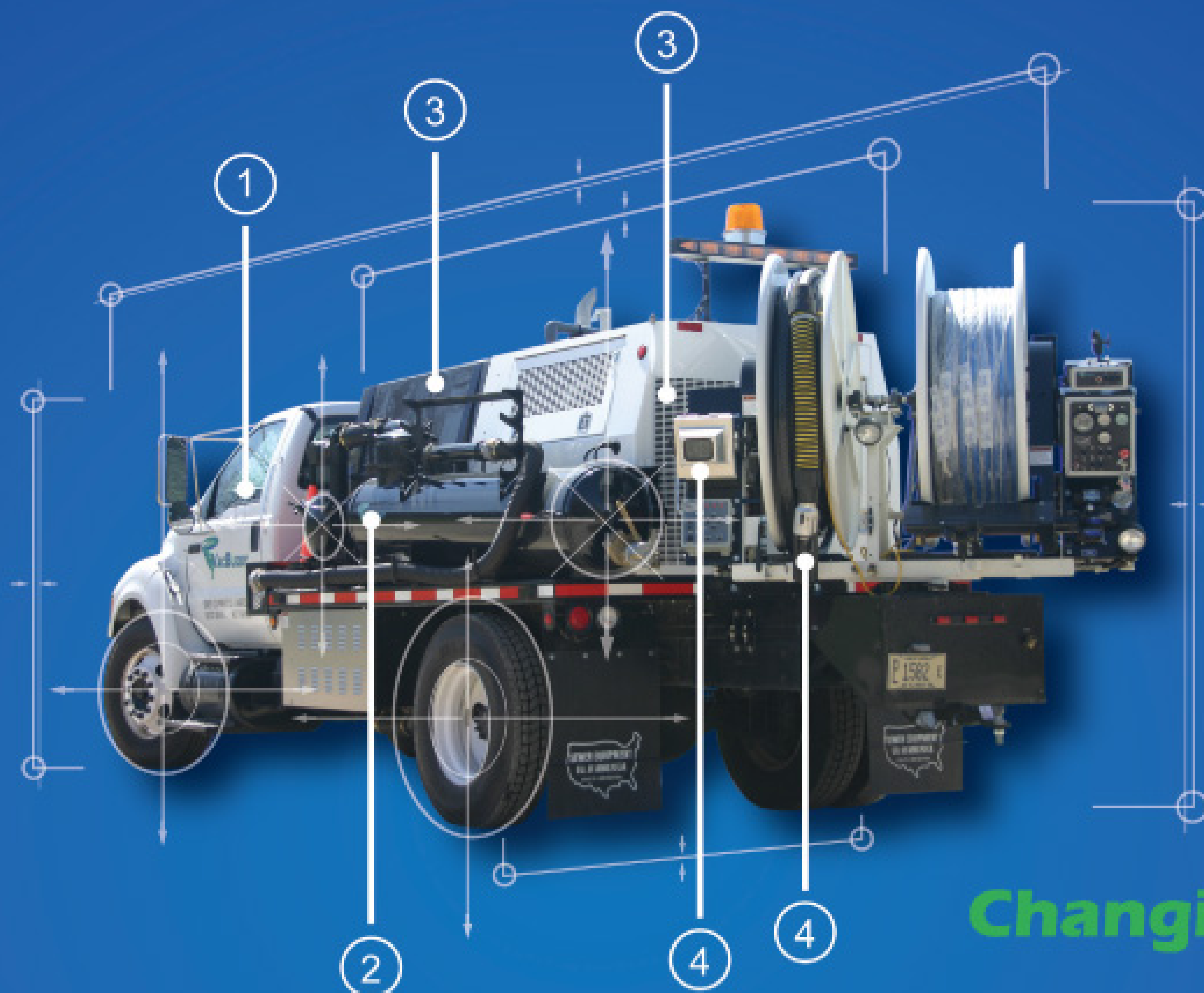
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