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April 2009

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in Monroe County, N.Y.,
advances water
quality initiatives

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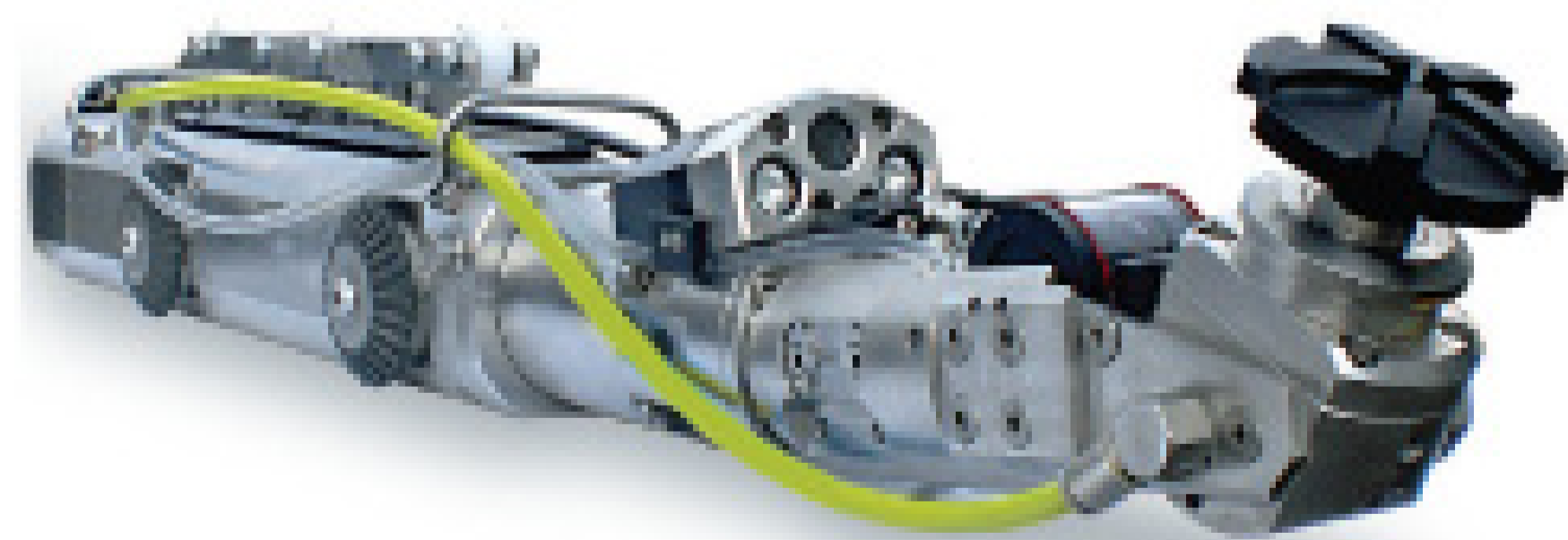
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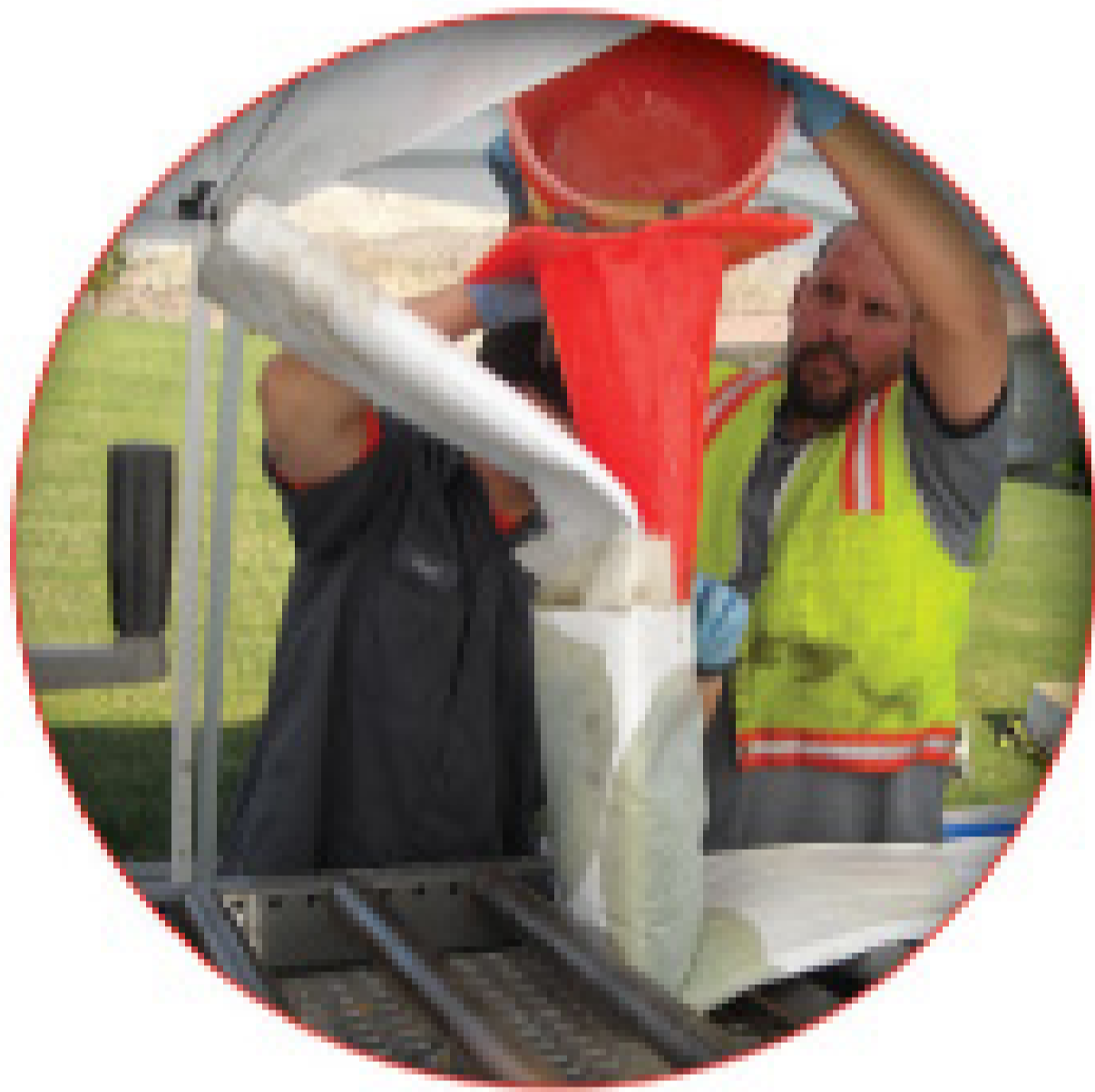
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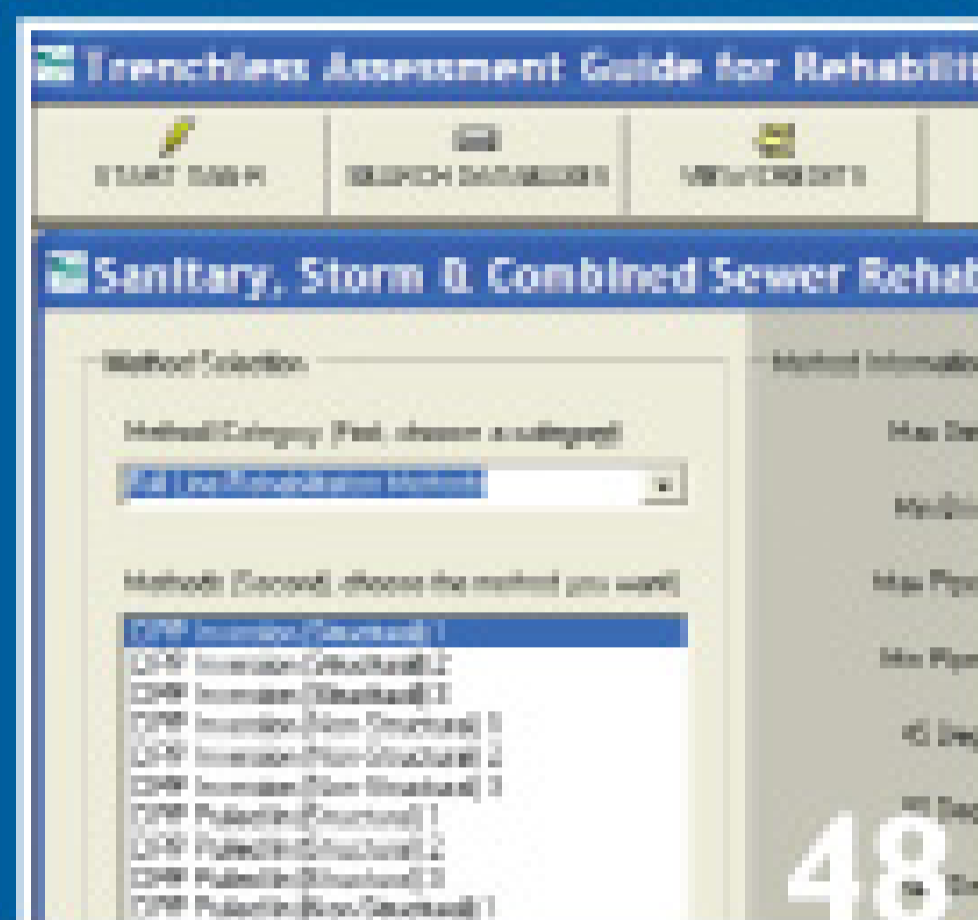
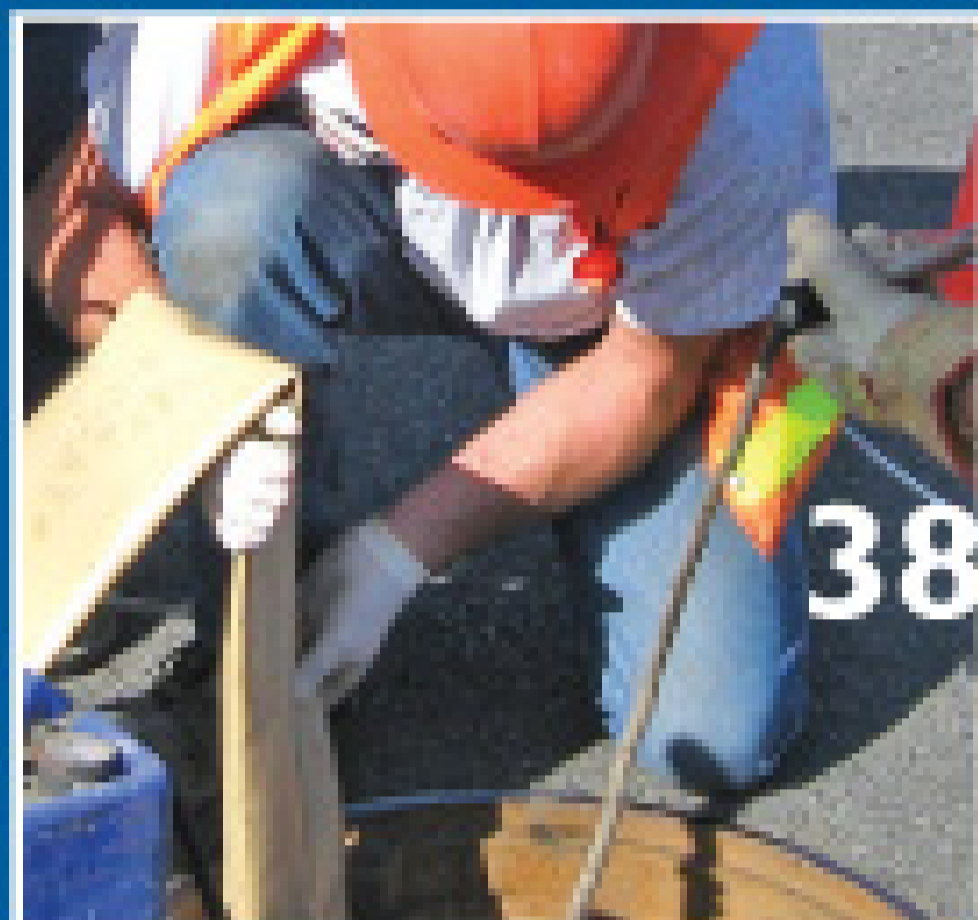
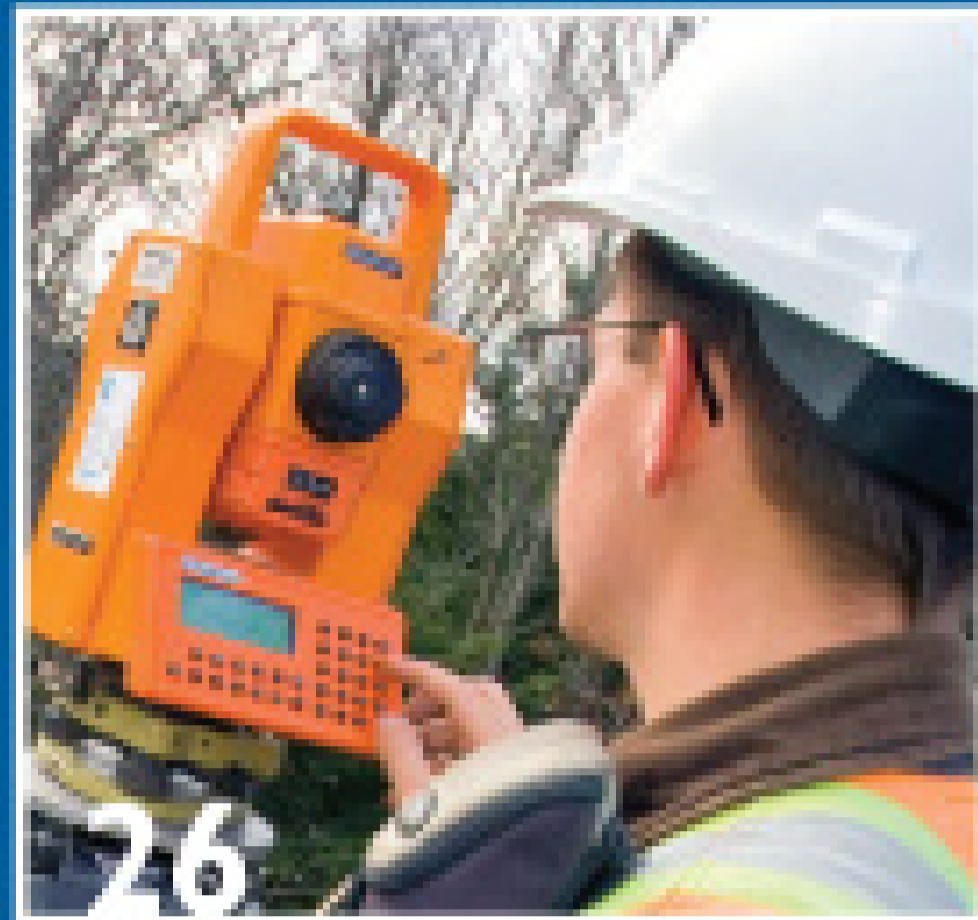
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INSIDE:

PIPE LINING ISSUE



COVER:

Stormwater education and community involvement are keys to protecting water quality in Monroe County, N.Y. System maintenance matters, too. Here, Andy Sansone, senior industrial waste technician with the county's Department of Environmental Services, Division of Pure Waters, checks a stormwater outfall in Rochester along the Erie Canal before taking a water sample. (Photography by Max Schulte)



COMING IN MAY 2009

Flow Controls and Monitoring/Dewatering and Pretreatment

- ◆ Sewer: Electronic sewer system mapping in St. Paul, Minn.
- ◆ Sewer: Flow monitoring in King County, Wash.
- ◆ Storm: Outreach and partnerships in Boulder, Colo.
- ◆ Better Mousetraps: CIPP lining for a small community sewer system.

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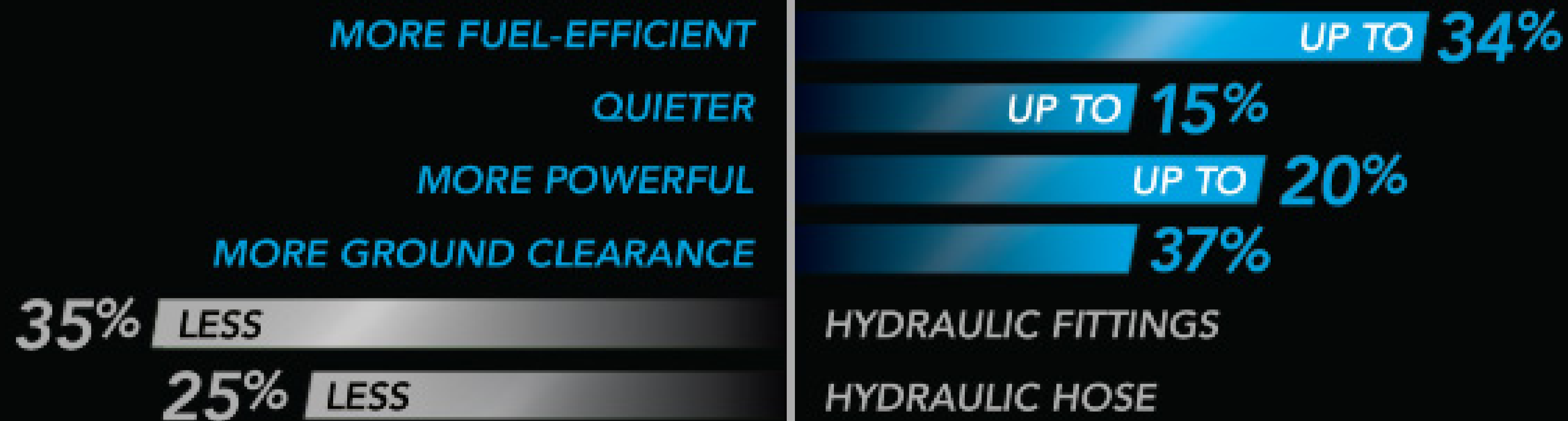
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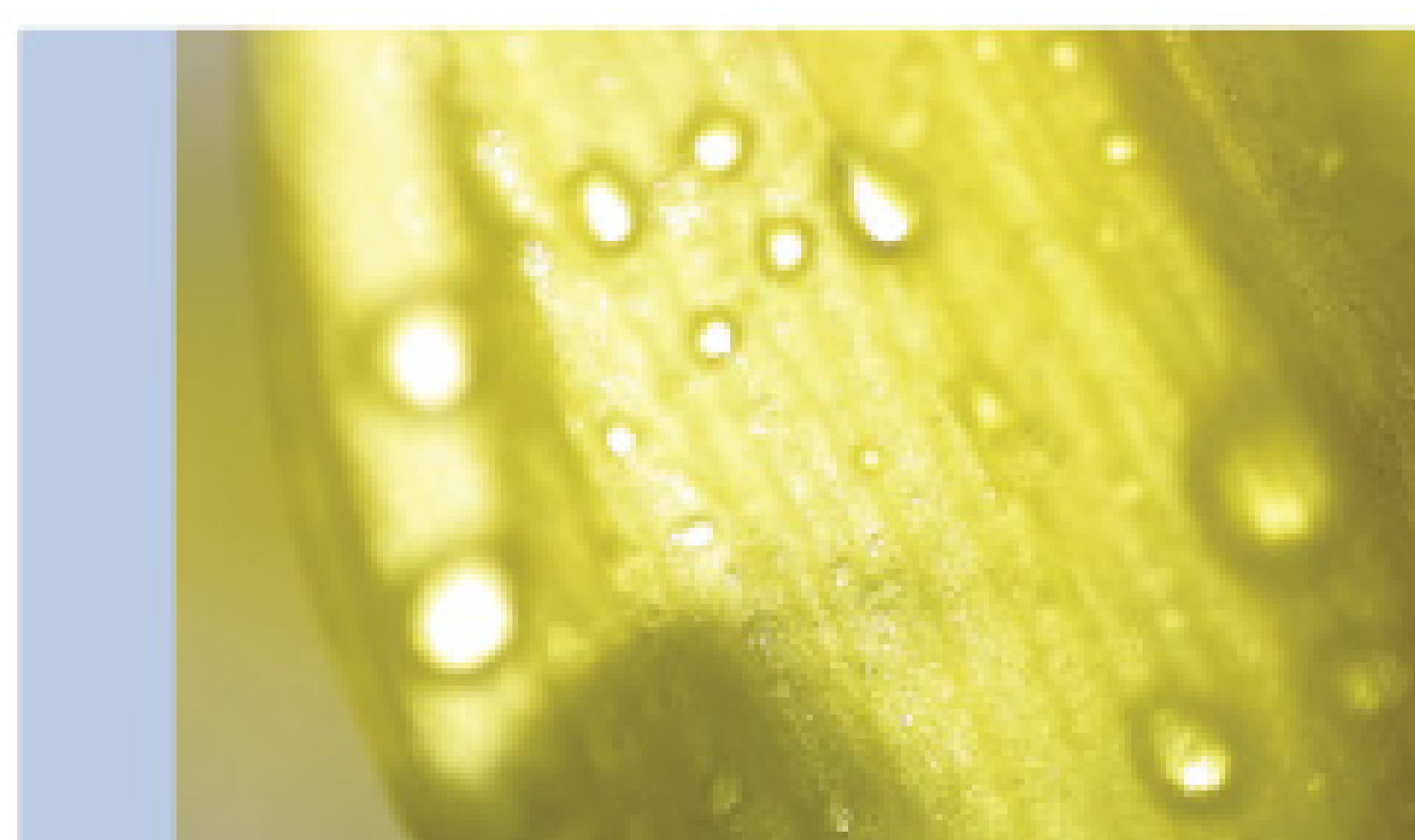
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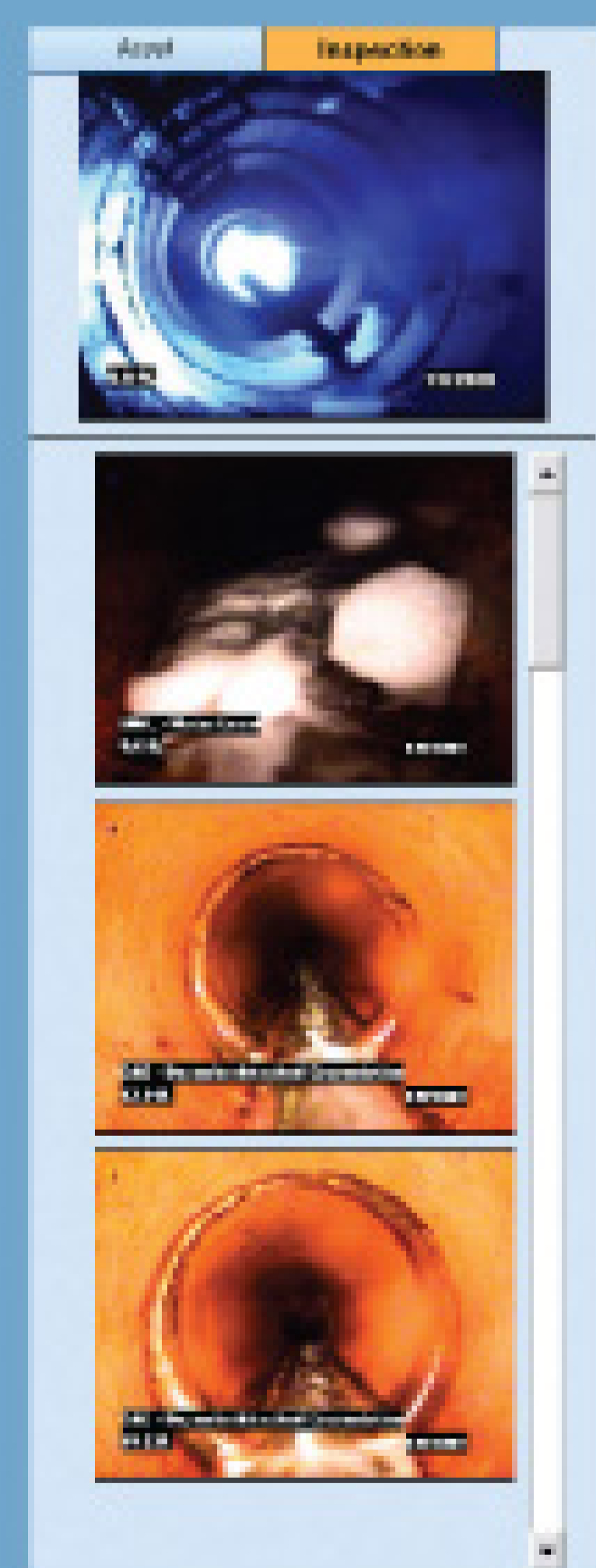
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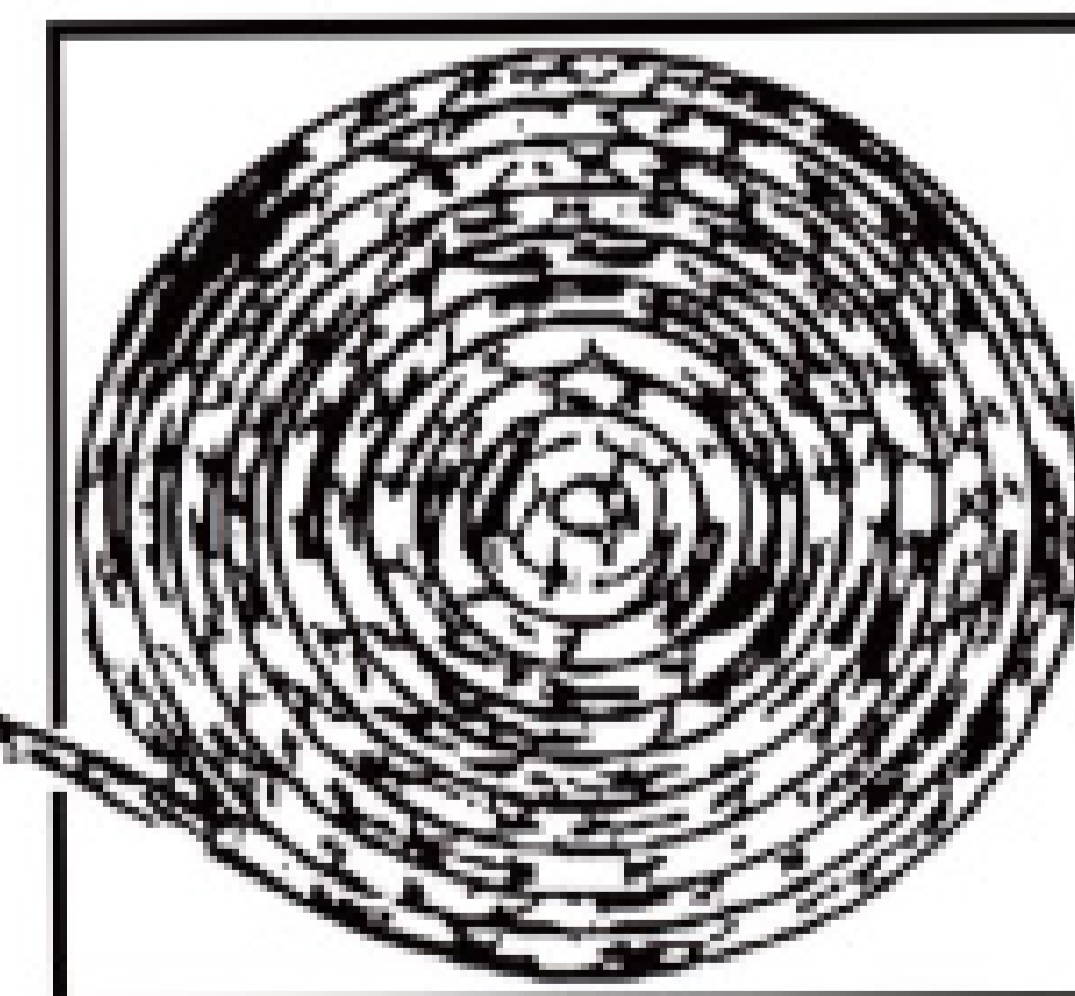
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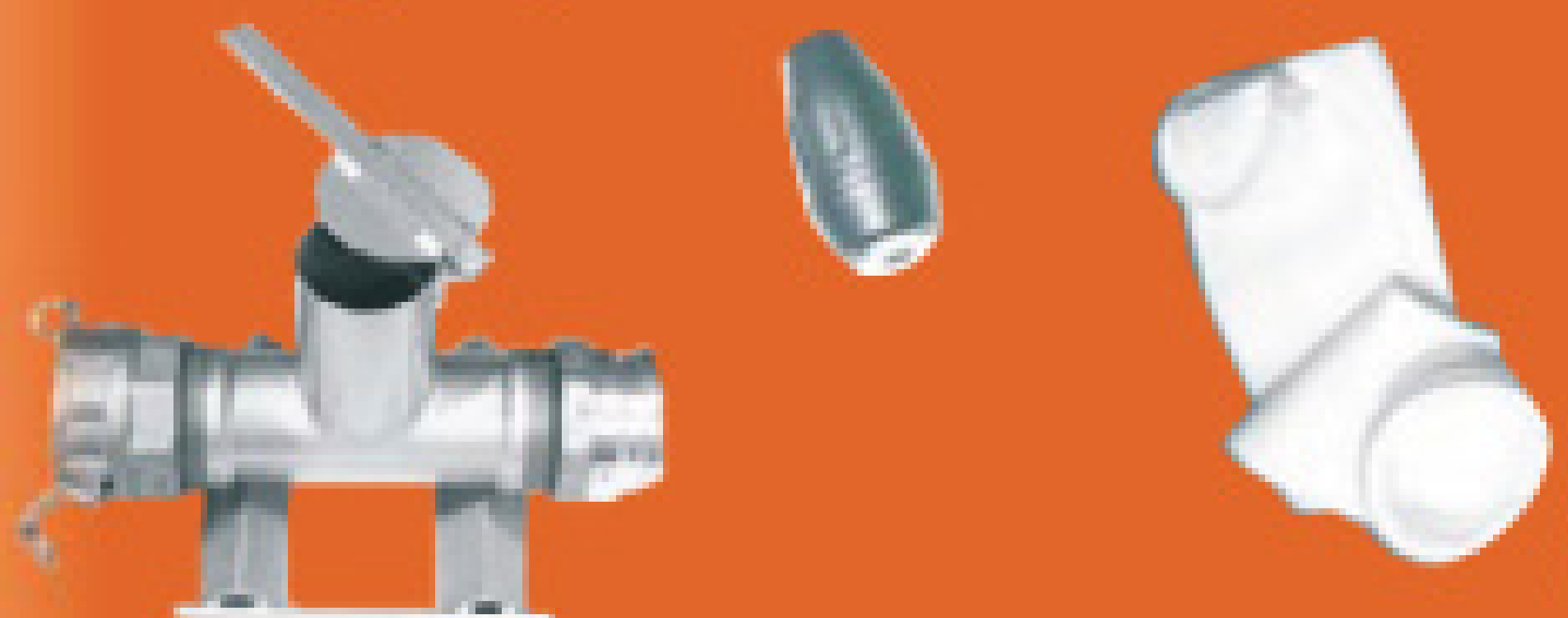
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Today's one-way approach to public spending and taxation threatens to strangle critical infrastructure rehabilitation and public services generally

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Right now, it seems public budgets are in the grip of a giant boa constrictor. This recession represents a large exhalation. Once the recession ends, will governments — specifically state and local — ever be allowed to inhale? The federal economic stimulus will help in the short term. But what about after that?

Even now, almost across the board, state governments are responding to recession-induced deficits by promising to cut spending. My own state of Wisconsin faces a \$5.4 billion shortfall, and our governor has asked department heads to cut their budgets. Talk about raising revenue consists mostly of whispers in the back corners — better keep it quiet lest the radio talk-show hosts hear.

Contrary views

A few courageous souls are arguing for sustained if not increased state spending. Paul Krugman, *New York Times* columnist and Nobel prize-winning economist, labeled the governors as “fifty Herbert Hoovers” for their fixation on spending cuts, which would inevitably fall hardest on disadvantaged people and would limit needed investments in public infrastructure.

Of course, continued state spending would mean raising taxes, which according to certain loud-mouthed constituencies is a mortal sin by definition at any time, and most of all in a slow economy. Raise taxes during a recession? And take more money from struggling people? Unthinkable!

But think about it anyway. About 30 years ago, a candidate here in Wisconsin ran for governor promising a one-year, 10 percent income

tax surcharge to cure a projected budget deficit. He won, the surtax was enacted, it did what it was supposed to, and it was removed after one year.

True, where taxes are concerned, the water in the well was not nearly as poisoned then as it is today. But the lesson still applies. It is not only possible, it is potentially publicly acceptable to raise taxes for a clear and beneficial purpose.

Squeezing away

Let's look at the likely effect of leaving taxes the same and making up the deficits just by cutting spending. First, employees' salaries and wages are frozen or raised only marginally. Next, spending on infrastructure projects is post-

Right now, it seems public budgets are in the grip of a giant boa constrictor. This recession represents a large exhalation. Once the recession ends, will governments — specifically state and local — ever be allowed to inhale?

poned. Then, maintenance is cut back. And finally dollars are nibbled from around the edges of almost everything.

Now, when the recession ends after a couple of years, attempts to restore funding and services to earlier levels inevitably will be labeled by the talk-show crowd as “runaway spending.” Employees are unlikely to get catch-up raises to make up for what they sacrificed. Postponed projects may or may not be revisited. Infrastructure work is unlikely to be accelerated to recover for the lost years.

The government has learned to “do more with less.” Now is the time to keep spending and taxes low. Raise taxes when times are good? And derail the recovery? Unthinkable! And the big snake's grip tightens down another notch.

But at what point does employee compensation fall so far behind the private sector that the best people quit public jobs? What happens to services when pay for public jobs becomes so unattractive that only the mediocre



FROM THE EDITOR

Ted J. Rulseh

find those jobs appealing?

At what point does deferred maintenance cause calamitous infrastructure failures? (Of course, little things like the I-35 bridge collapse in Minnesota and the Christmastime water main break in Maryland aren't really relevant, are they?) Sooner or later, tax cutting and “spending restraint” begin to choke the life out of public services we value. A federal stimulus package with borrowed money may help for a while, but it won't address the underlying issues.

Another view

Now, what happens if, for example, state taxes are raised at a time when the economy is down and people are out of work? Most states rely mainly on income taxes. So higher rates affect the unemployed marginally if at all because they have little income to tax. The result is that people who still have jobs end up kicking in some extra to help sustain services for everybody.

Of course, when needed projects are paid for instead of scuttled, and when maintenance work is continued instead of deferred, people are put to work and some of the bite is taken out of the recession. All this is part of what it means to live in a society instead of a place where the rule is “everyone for himself.”

All right, the question of raising taxes isn't as simple as all that. For example, many if not most households today rely on two incomes, and if one person is out of work, both struggle, and higher taxes on the remaining income would hurt that household.

The point remains, though, that raising revenue (raising taxes) should seldom if ever be taken off the table in the discussion of how to pay for necessary services in good times and bad. The mere fact of having the discussion is a good start. To treat a potentially valid option as off-limits is to fall prey to that big, nasty snake. ♦

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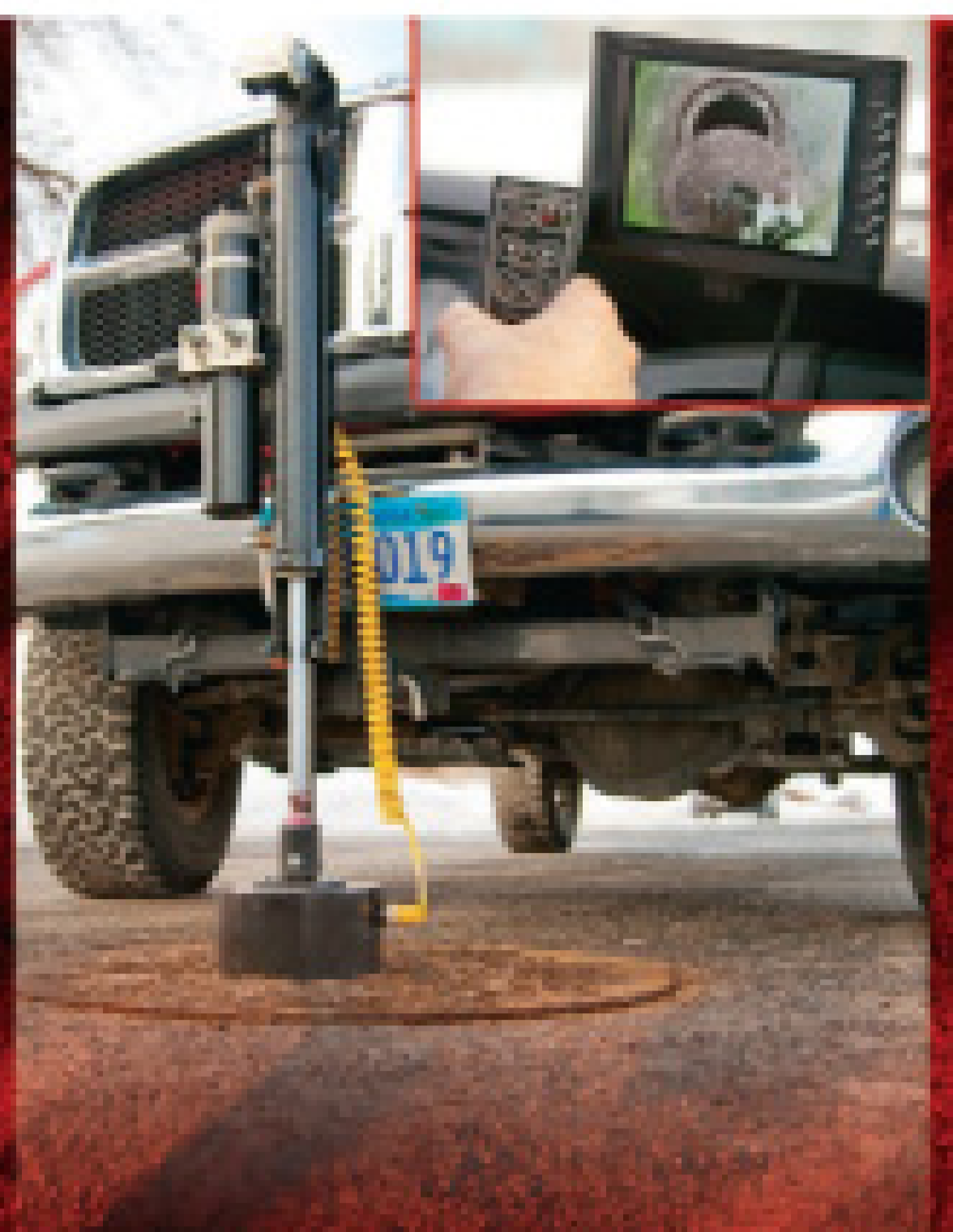
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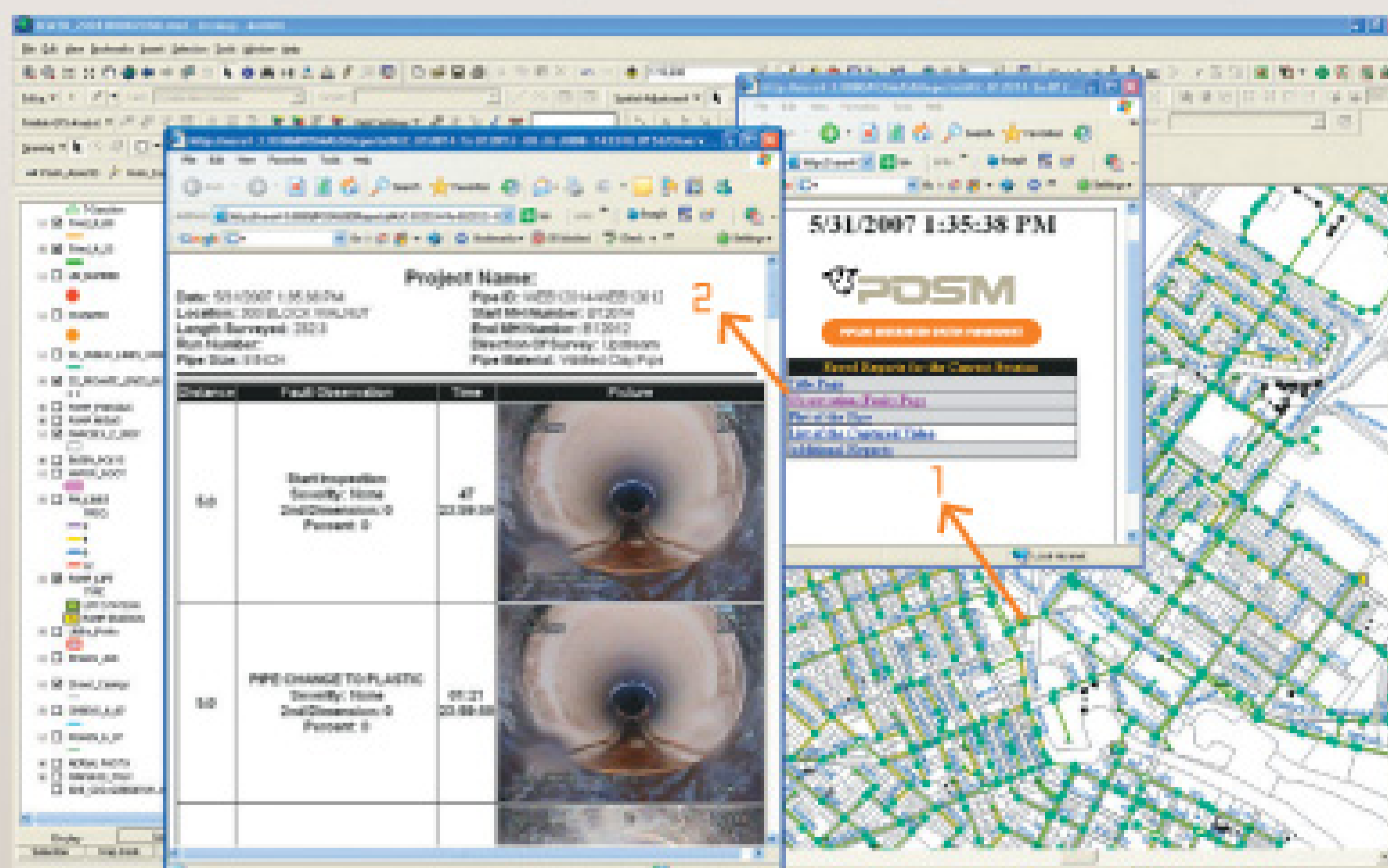
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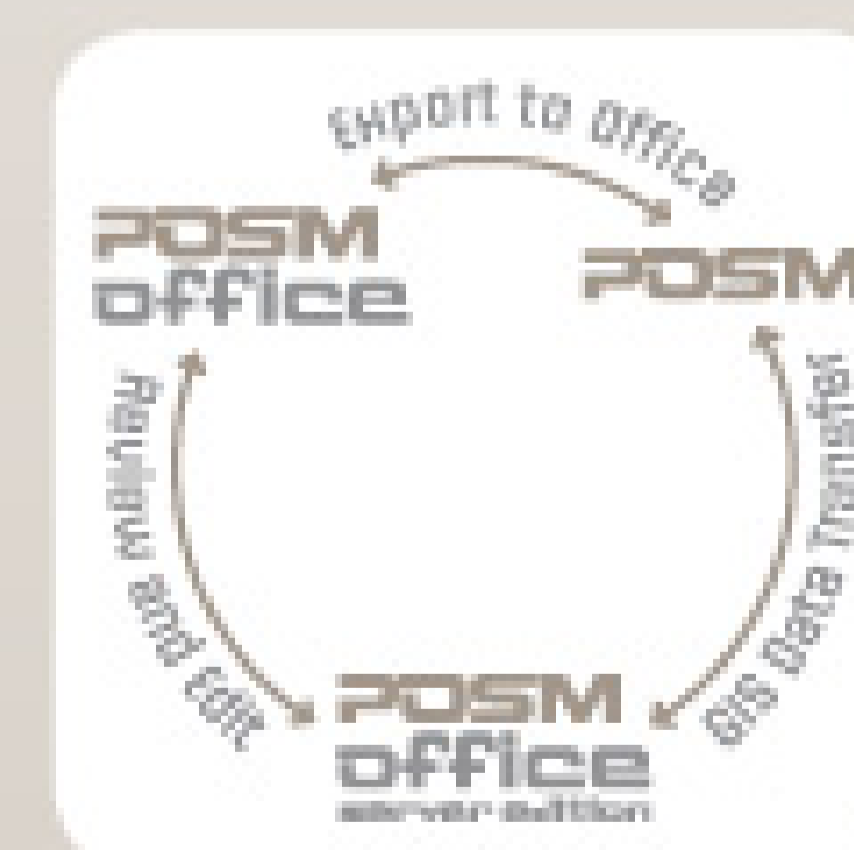
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BUILDING MOMENTUM

A coalition in Monroe County, N.Y., advances water quality initiatives and leverages partnerships to tackle stormwater issues

By Mike Gremier



From left, Alan Oates, an intern with the Monroe County Department of Environmental Services; Kevin Quigley of the Town of Brighton; and Andy Sansone, senior industrial waste technician with Monroe County, perform storm sewer testing. (Photography by Max Schulte)

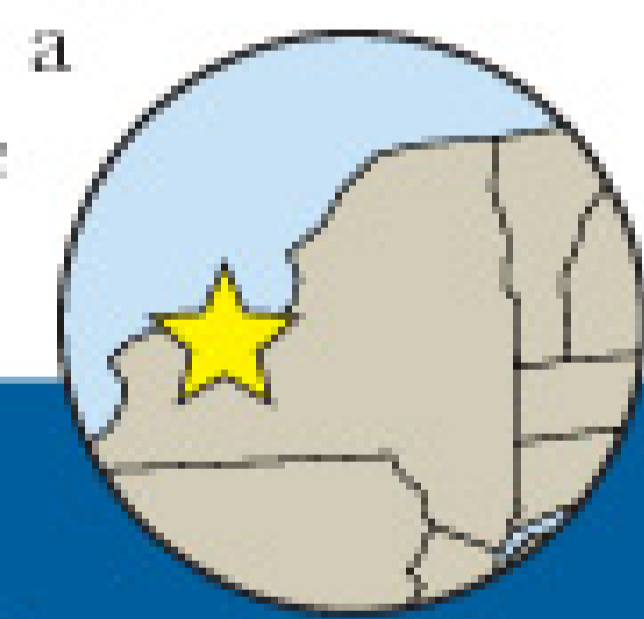
In New York state, the largest source of pollution is stormwater. It's a problem more and more residents of Monroe County are gradually learning to address, thanks to an aggressive public education and involvement program that builds on existing initiatives and makes the most out of partnerships.

The county's strong push for stormwater education is largely driven by the desire to protect water resources, according to Todd Stevenson, a planner for the

county Department of Environmental Services.

"People really care about our water resources, and they want to see them protected and improved," says Stevenson, who oversees the public education task force for the Monroe County Stormwater Coalition. "It's a matter of focusing the efforts in the right place.

"There's a long tradition of towns and villages working together on a variety of different issues, including water quality. We've made a lot of progress in water pollution, but urban stormwater runoff is a big issue that we have to tackle."



PROFILE:

Monroe County (N.Y.) Stormwater Coalition

ESTABLISHED:
2000

COUNTY POPULATION:
736,000

COUNTY AREA:
1,366 square miles

ANNUAL RAINFALL:
34 inches

WEB SITE:
www.monroecounty.gov/eh-stormwater.php

Tackling it head on

To address the issue head on, the county formed the stormwater coalition in 2000. The action coincides with the state's implementation of the EPA's NPDES stormwater permitting program, which calls for communities with municipal separate storm sewer systems (MS4s) to comply with New York state's Phase II stormwater regulations.

The coalition is a partnership of 25 towns and villages, as well as the county Department of Transportation and the Rochester Pure Waters District, in conjunction with the Monroe County Department of Environmental Services. Another member is the State University of New York-Brockport.



Monroe County relies on volunteerism as well as dedicated staff members like Andy Sansone (left) and Alan Oates to help protect local resources against stormwater contamination.



Andy Sansone bags a sample of water collected while storm sewer testing.

MAKING IT STICK

Although the Monroe County Stormwater Coalition's partnerships extend to virtually all aspects of the community, many are designed to spread the message about stormwater in a sustainable way so that the message sticks.

As an example, the coalition partnered with the State University of New York-Brockport to develop stormwater curriculum modules for seventh and eighth graders. SUNY-Brockport, which blends liberal arts with professional studies, offers 23 areas of teacher certification. The stormwater modules meet the state's teaching standards.

Outside the classroom, the coalition formed a partnership with the Rochester Museum & Science Center to develop a permanent interactive stormwater exhibit. The museum has been closely involved with water quality education in Monroe County for years. The coalition will fund the exhibit at the museum, which attracts some 500,000 visitors per year.

All the while, residents and businesses are also asked to partner on the issue and make stormwater pollution a priority. The coalition looks to pet owners for support. These people help by placing dog waste in coalition-provided waste stations at various parks. Each station includes signage, a waste receptacle and disposal bags.

Another group targeted is septic system owners. The coalition mails them reminders to have their systems inspected and pumped out every two to three years. And since septic system owners are targeted, why not include septage haulers? How about car washes and lawn care services?

"There's a lot of opportunity for us to get together in terms of coordinating our message," say coalition representative Todd Stevenson. "It just takes time."

To manage the collective effort, the coalition created task groups to focus on specific issues. The groups include Education and Public Participation, Illicit Discharge Detection and Elimination (which also oversees work related to pollution prevention and good house-keeping), and Construction Site Stormwater Runoff Control and Post-Construction Management.

The groups have their hands full, as stormwater runoff makes up 63.3 percent of the pollution in the state's waters, excluding atmospheric deposition and contaminated sediment. In Monroe County, runoff is the source of 80 percent of the water problems.

That's not to say that the county hasn't worked on the problem. In fact, the county has placed special emphasis on water quality because of the presence of Lake Ontario and the Genesee River Watershed. Through the years, a variety of programs have led to significant improvements in the Rochester Embayment, the Genesee River and Irondequoit Bay. Yet the NPDES regulations drove the need for the stormwater coalition.

"The towns and villages felt that

"If people understand the basics of stormwater, they can educate each other. If I'm a homeowner and I understand the issue, and I see my neighbor dumping old paint down the drain, I'll know that's a bad thing and I can talk to them about that."

Todd Stevenson

implementing their own education program would not be efficient or effective, which is why we decided to come together," Stevenson says.

Reaching out

At the outset, the coalition identified a variety of programs launched before 2000 that could be strengthened with its financial support. An example is a citizen stream-monitoring program. Funding that popular program makes sense, Stevenson says, but stormwater education dictates a different strategy.

"Our focus is on projects and programs that are more sustainable and reach a bigger audience," he says. "It's a great way to get people involved, but it doesn't reach the number of people we need to reach."

In keeping with its partnership approach, the coalition teamed with the Water Education Collaborative (WEC) and the Ad Council of Rochester to develop a media campaign. Formed in 2001, WEC is a coalition of organizations working to advance water quality educa-

tion. The Ad Council is a nonprofit collaborative of local businesses and volunteers and provides marketing and communications programs for nonprofits.

The first step in the media campaign involved a 2006 telephone survey, in which only 33 percent of those surveyed understood that stormwater is discharged to the nearest waterway without being treated. Only 18 percent knew that urban stormwater runoff was a primary source of water pollution.

"That made it clear we had a lot of work to do," Stevenson says. "We needed to start at the very

The advertising campaign, launched in 2007, communicates a basic message about stormwater pollution and directs people to the H₂O Hero Web site. Ideally, it will also move people to act. However, Stevenson says the coalition and its partners are fully aware of advertising's limitations.

"We knew a mass media campaign is a great thing to do, but that it was not going to be enough," he says. "There's only so much you can say in 30 seconds and only so much information people can absorb when they look at ads."

"I think it's an extraordinary thing that all of these municipalities have all been able to work together through the coalition. There are a lot of people working together, and they've done a fantastic job of pooling resources so they can be most effective."

Todd Stevenson

beginning and teach people how the plumbing of the storm system works and explain that anything that goes down the drain ends up in the nearest waterways."

H₂O Hero

The coalition decided early on that media would help spread the word. However, it first needed an identity. For that, it looked to WEC and the Ad Council, along with a professional marketing firm. Together, the group developed H₂O Hero, an animated character created by internationally known illustrator David Cowles.

The H₂O Hero character, named Larry, is the focal point of the campaign. The idea is that anyone can be an H₂O hero, since everyone "has the power" to improve the county's waterways.

With H₂O Hero and clear messages established, the coalition and its partners moved forward with a multimedia campaign, which includes a Web site aimed at stormwater and water quality education. H₂O Hero is at the heart of the campaign, which is funded with help from a grant obtained by the Ad Council.

The coalition also took advantage of the Ad Council's bank of donated ad space. All told, donated space amounted to \$139,000, versus \$30,000 of paid space.

Volunteerism at its best

To supplement its media campaign, the coalition again looks to partnerships. The strategy capitalizes on the county's tradition of volunteers working on water quality. "We try to look out in the community and see who else has an interest in our issue," Stevenson says. "If they do, we partner with them instead of doing our own thing. There are a lot of resources out there and we just don't have the funds to be reinventing all sorts of wheels."

One partner is the Cornell Cooperative Extension (CCE) of Monroe County. The coalition contracted with CCE to give school and community presentations on how to cut stormwater pollution. It also contracted with WEC to give stormwater presentations in schools. Each year, about 8,000 students and residents take part in stormwater education presentations and events, typically featuring a demonstration of a watershed model and emphasizing opportunities to volunteer.

The programs also supplement volunteer efforts of groups such as

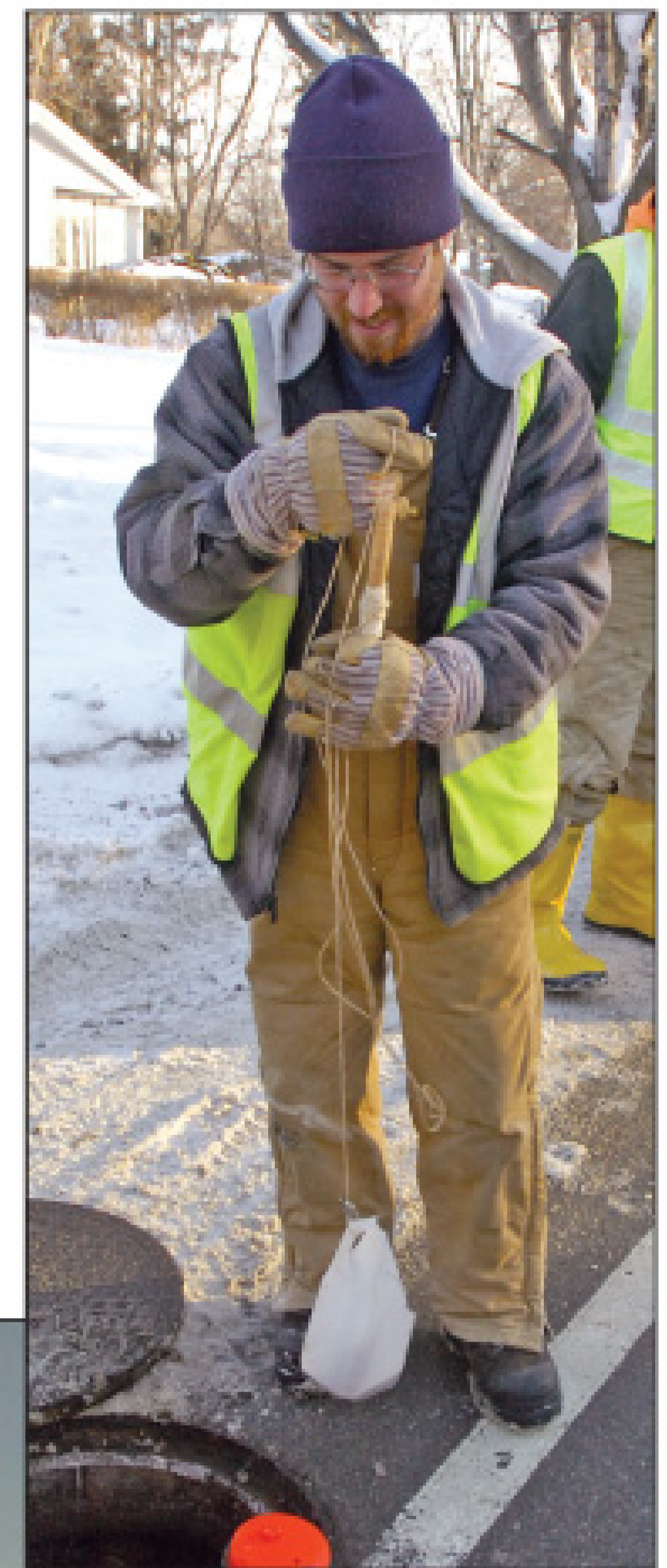
Andy Sansone makes his way in the snow and cold to collect a water sample at a stormwater outfall in the City of Rochester along the Erie Canal.

Alan Oates lifts a stormwater water sample. Regular testing helps Monroe County keep tabs on stormwater quality.

the local Boy Scouts. So far, groups of citizens have adopted and monitored more than 100 streams. Volunteers also help to spread the word about stormwater pollution.

In all, volunteers have installed as many as 3,500 H₂O Hero storm drain markers and distributed 40,000 door hangers. The door hangers, in the shape of a fish, outline behaviors that help minimize stormwater pollution.

In the meantime, the coalition takes partnerships and volunteerism to even higher levels with aggressive education initiatives, as well as an assortment of programs targeted at specific groups. Stevenson says the volunteer efforts, combined



with the media campaign, create momentum for change.

"If people understand the basics of stormwater, they can educate each other," he says. "If I'm a homeowner and I understand the issue, and I see my neighbor dumping old paint down the drain, I'll know that's a bad thing and I can talk to them about that."

Addressing illicit discharges

Monroe County is also pushing forward on other MS4 Phase II stormwater compliance measures. It is making notable headway with IDDE initiatives, particularly in mapping and inspecting stormwater outfalls.

To better manage outfalls, the coalition provides technical assistance to members as a shared service. As of fall 2008, the coalition and participating members mapped 98.1 percent of the outfalls and inspected 2,400 of the 7,400 outfalls. The inspections identify indicators of possible illicit discharges. In all, the inspections revealed 188 cross-connects with sanitary sewers.

"We've learned that illicit discharges are much more widespread than we thought," Stevenson says. "Many towns and villages thought they didn't have a problem. However, we've found significant numbers of illicit discharges in all types of areas."

In response, the coalition developed a model ordinance that prohibits illicit discharges, which the municipalities adopted. Moving forward, the coalition is addressing transitory sources of illicit discharges, such as illegal dumping.

Construction runoff

The coalition is also making progress on construction site stormwater runoff by working closely with the Monroe County Soil & Water Conservation District and others.

Here, initiatives range from educational literature to work geared to ensuring that developers adopt best management practices, such as minimizing site disturbance, installing silt fencing, reestablishing vegetation, and creating sedimentation basins.

Under contract with the coalition, the district also provides technical assistance to member

municipalities, reviewing development plans, inspecting construction sites, and providing training. Other initiatives include retrofits to facilities such as stormwater basins. Retrofits may involve modifications to the structure or regrading facilities so that they function as stormwater wetlands.

The coalition and its partners also work on new approaches to dealing with construction site runoff. One tactic involves creation of rain gardens. Two rain gardens were built in 2007, and the City of Rochester later created several more.

As with IDDE, the coalition's task group also created two model ordinances. The efforts are producing results, but not without hurdles. "One of our biggest challenges is ensuring developer compliance with the erosion-control requirements," Stevenson says. "It requires a lot of staff time to do inspections and the necessary follow-up."

Making a difference

The challenge of getting developers to adopt best practices is a prime example of the coalition's bigger challenge: time and money. "I think it's an extraordinary thing that all of these municipalities have all been able to work together through the coalition," Stevenson says. "There are a lot of people working together, and they've done a fantastic job of pooling resources so they can be most effective."

Moving forward, Stevenson says a major focus is funding. The coalition is discussing the concept of a countywide stormwater district, which would collect a fee for shared services provided by the coalition. For now, the coalition will continue doing what it does best: facilitating the sharing of resources, leveraging partnerships, and building on existing programs and expertise.

It's a strategy that works, but Stevenson points out that it all hinges on the desire to make a difference. "It's not just about complying with a bunch of regulations," he says. "People really care about our waterways and want to do a great job." ♦

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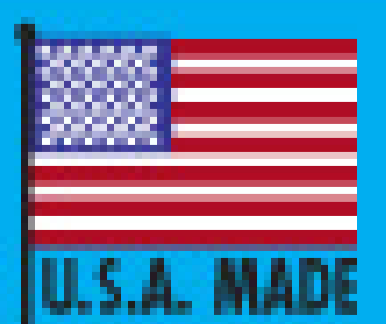
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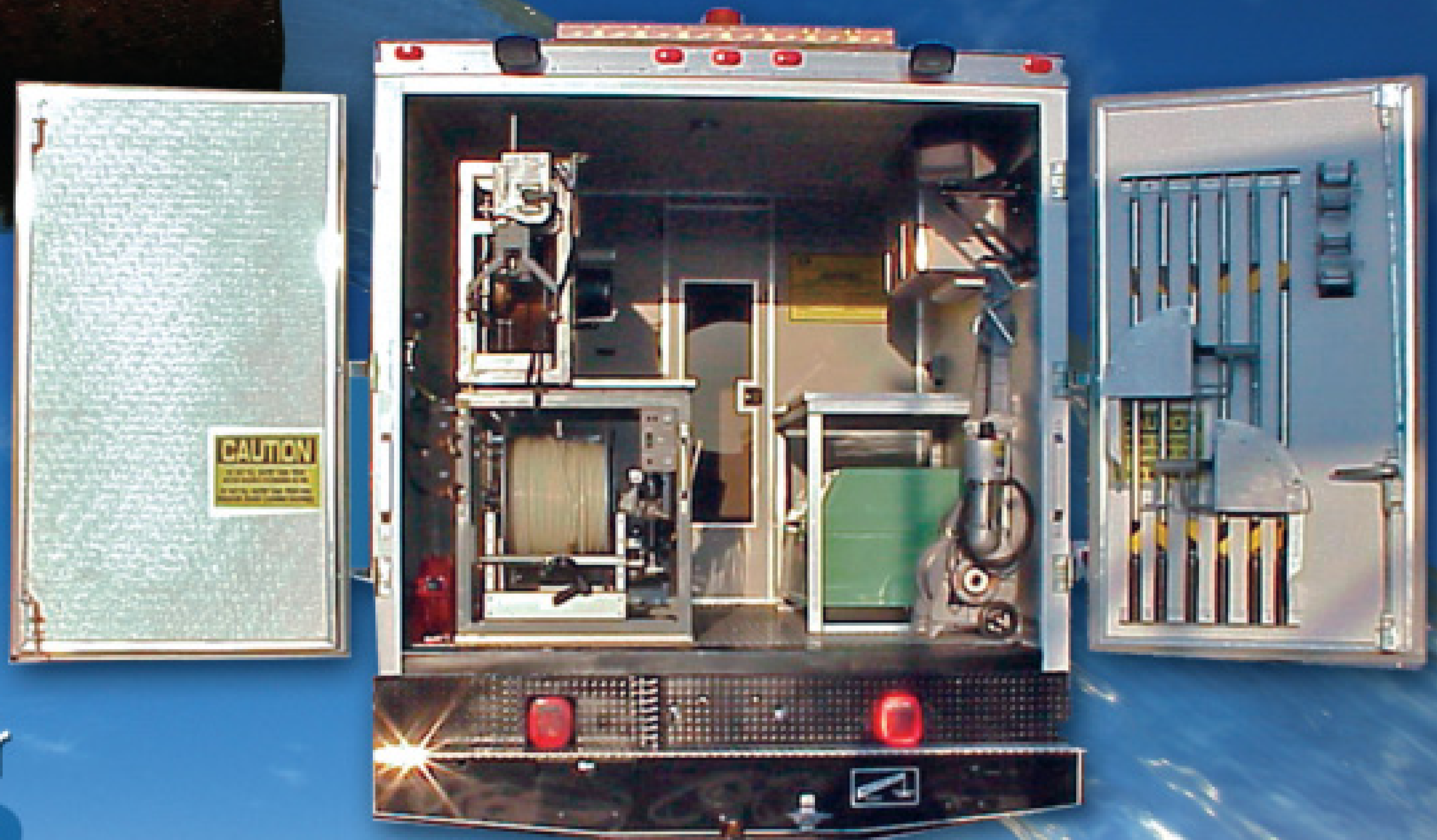
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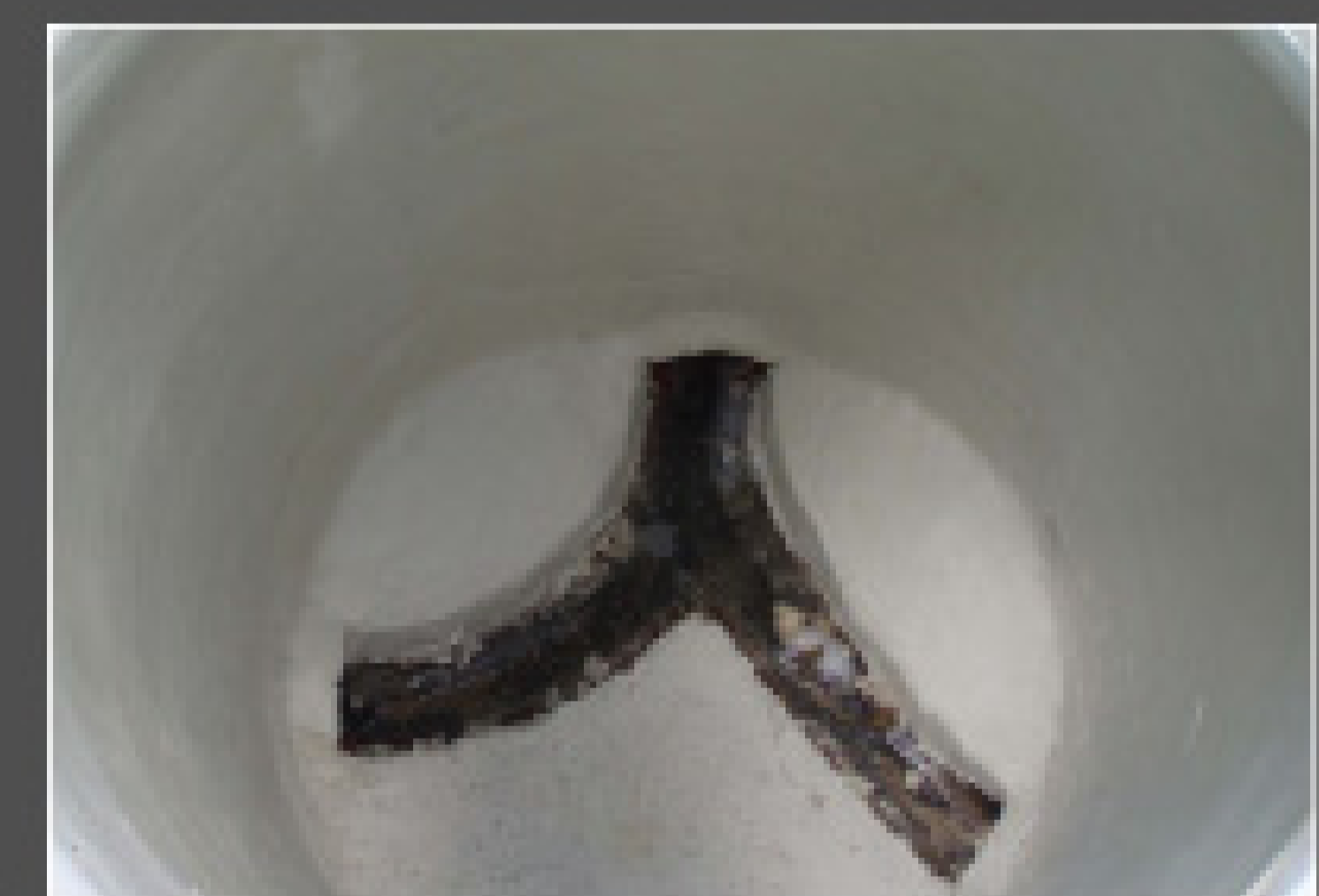
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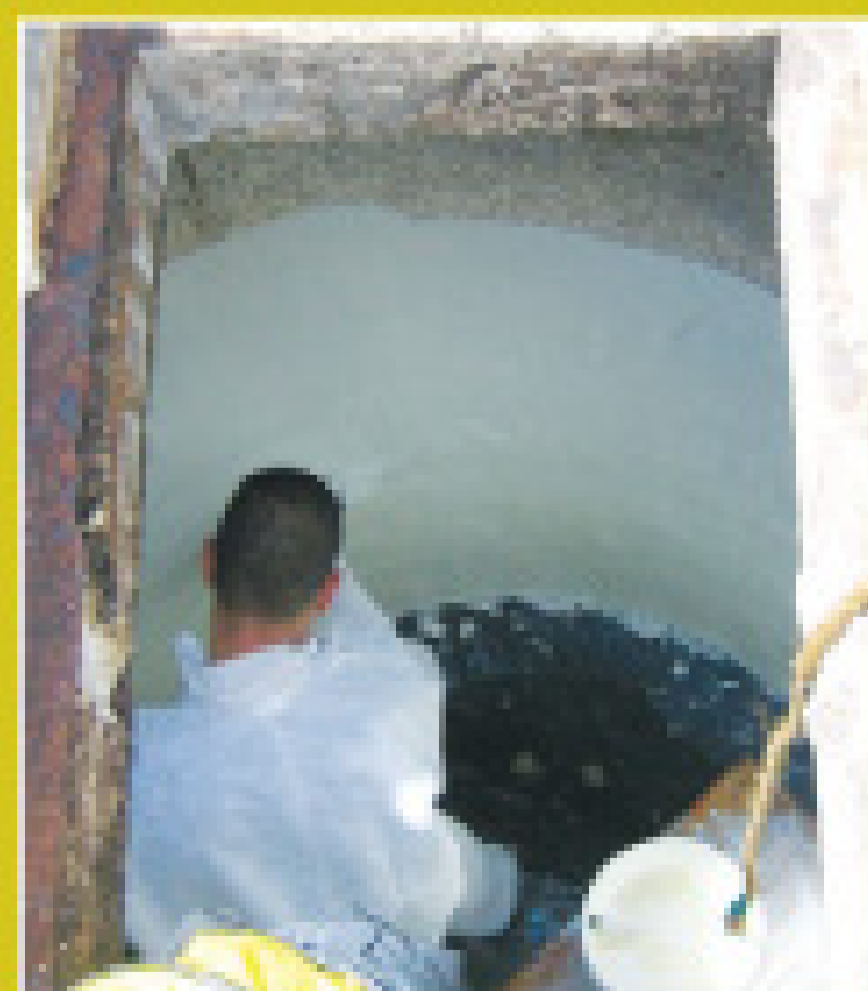


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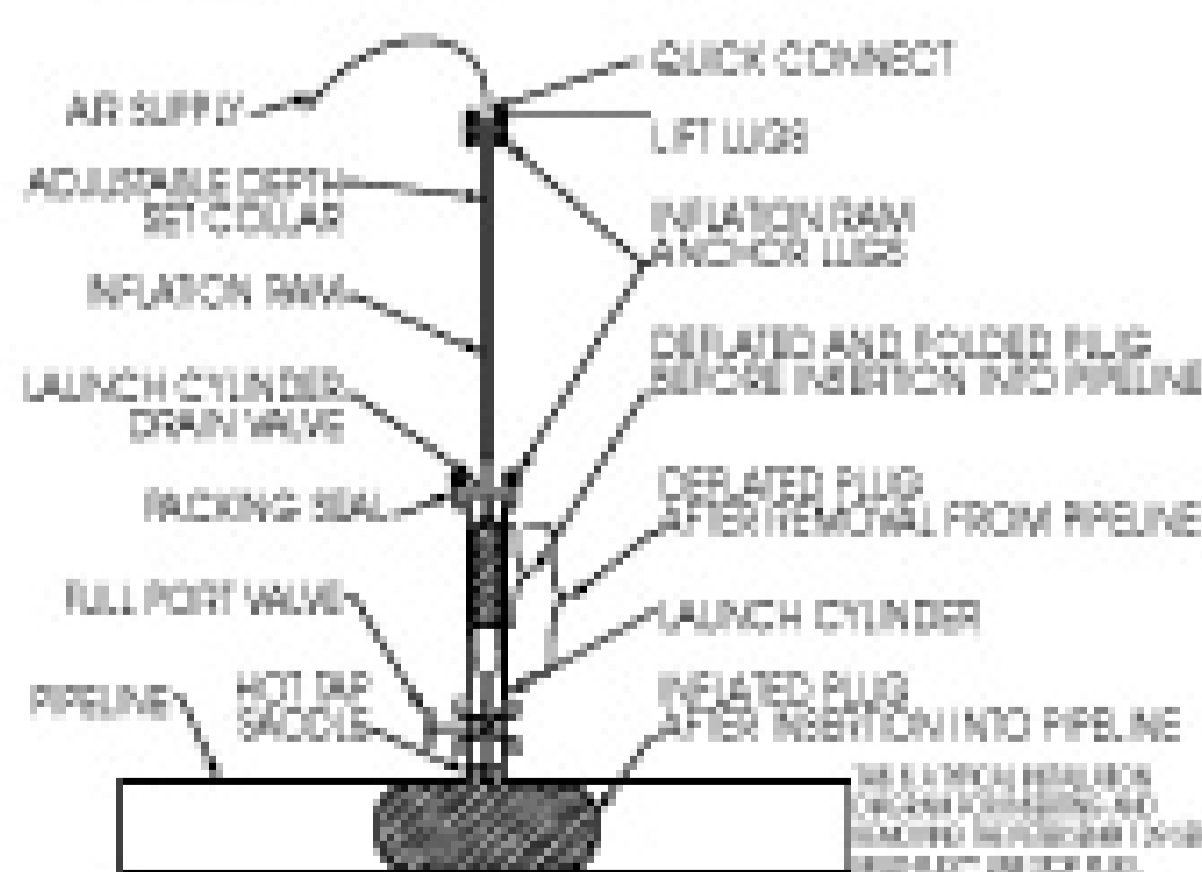
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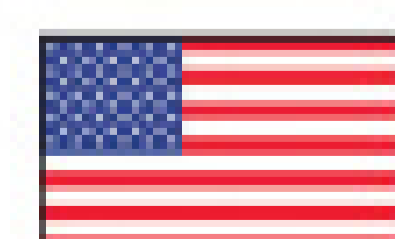
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Halifax team members Deangelo Willis and Taylor Cook guide a loader operator backfilling a pipe trench with crushed rock. Work crews used trench boxes extensively for shoring. (Photography by David Grandy)

FOCUS: WATER

NEPTUNE'S TRIDENT

The Halifax Regional Municipality in Nova Scotia uses a three-pronged approach to renewing, rehabilitating and protecting a growing water distribution system

By Peter Kenter

Maintaining the distribution infrastructure is a critical challenge for the Halifax Regional Water Commission (HRWC), known locally as Halifax Water.

The HRWC, centered in Halifax Regional Municipality (HRM), the capital of Nova Scotia, supplies water for the area's 350,000 residents and businesses. Created under a 1996 amalgamation, HRWC is an autonomous, self-financed utility.

The amalgamation brought together several water systems, including the former city of Dartmouth across Halifax Harbour. Faced with providing the same standard of service to all customers and providing a basis for future system growth, Halifax Water embarked on an ambitious three-pronged program of water main replacement, main rehabilitation, and main protection.

Badly deteriorating water mains are replaced mainly by conventional methods. More sound mains receive a spray-on epoxy lining. Mains in good condition are preserved through cathodic protection, which combats corrosion.

Jamie Hannam, manager of engineering and information services with HRWC, observed that the program has been effective in preserving high-quality water service and in the long run will provide part of the foundation for distribution system growth.

Wide area

The water service area covers more than 200 square miles of some 2,000 square miles included in the amalgamation. Although the water systems of the former cities of Halifax and Dartmouth are nominally connected by a single 32-inch emergency main that crosses Halifax Harbour beneath

the Angus L. Macdonald Bridge, the two systems are distinct entities. In an emergency, millions of gallons of water could be sent from either system to the other through the connecting main.

All told, the system encompasses almost 800 miles of water mains, two major water treatment plants (one 24 mgd, the other 60 mgd), seven smaller treatment plants, 16 storage reservoirs, more than 7,000 fire hydrants and 77,000 customer connections. A series of glacial lakes provide abundant fresh water to the ocean-bound region. One large lake supplies Halifax and another supplies Dartmouth. The watersheds are protected by the province to guarantee the quality of supply.

"Although the HRM is a fairly new entity, this is a historical fort city at its heart, with a lot of very old infrastructure," says Hannam.

"The oldest main in service dates



PROFILE:
Halifax (Nova Scotia)
Regional Water
Commission

INCORPORATED:
1996

POPULATION SERVED:
350,000

AREA SERVED:
Approx. 200 square miles

EMPLOYEES:
360

INFRASTRUCTURE:
780 miles of water mains

ANNUAL BUDGET:
\$56 million operating,
\$27 million capital

WEB SITE:
www.halifax.ca

back to the 1850s, although there's not a lot of it left in the system. About 60 percent of the system is cast iron pipe that spans two generations. The first generation, which was being installed up to 1940, is thicker and more robust than the thinner-walled pipe installed during World War II and the years that followed. In the 1960s, the system switched to ductile iron."

Halifax Water is largely committed to replacing metal pipe with more metal. That's because the city's aggressive leak detection campaign relies on the delicate acoustics of metal-to-metal connection.

"We need to maintain the integrity of the system," says Hannam.

"We record the night-time flows into each of the isolated areas, and if we notice flows greater than the historic night-time lows, we send a field crew to that zone within 24 hours."

Jamie Hannam

"If you replace a length of iron pipe with plastic, you throw off the acoustics, so we virtually always replace the pipe with new ductile, with only a nod to PVC pipe in isolated usage."

Looking for leaks

The system is broken down into more than 90 district meter areas (DMAs) that can be temporarily isolated by a series of valves to run remote pressure checks. Rather than monitoring pressure during the day, when flows are variable, the utility uses its Supervisory Control and Data Acquisition (SCADA) system to monitor low flow rates, which are steadier.

The system can monitor water entering or leaving the system. "We record the night-time flows into each of the isolated areas, and if we notice flows greater than the historic night-time lows, we send a field crew to that zone within 24 hours," says Hannam. "We pinpoint the leak hydrant-to-hydrant and valve-to-valve using acoustic gear from Sewerin. We use the ground mike for its range and sensitivity for both surveying and pinpointing, and we use correlators from



Taylor Cook works with a soil compactor on a pipe installation.

Plamer Environmental to assist in pinpointing. Once the leak is identified, we dig and repair within three days."

Leaks are generally repaired with stainless steel clamps tightened around a neoprene gasket, a low-cost fix that has served the system well.

The leak detection program is already mature: Most historic leaks have been taken care of. Hannam notes that the system experiences 200 to 250 leaks annually, a number that has remained constant over the past few years.

"We follow up with an annual leak detection survey and noise mapping to pick up any leaks that aren't reported by customers or escape our SCADA system," he says. "Some systems comparable to ours run checks annually or semi-annually, but that isn't good enough for us. It's not only a drain on revenue, but it robs the system of pressure and causes considerable long-term damage by undermining the support around water mains." All mains in the system are graded according to three categories:

- Structurally deteriorated and ready for replacement.
- Structurally sound, but short on performance and ready for cleaning or lining.
- Structurally sound with acceptable or good performance and candidates for cathodic protection.



Joshua Levy, field inspector with Terrain Group, shoots elevations.

WHAT IS CATHODIC PROTECTION?

Cathodic protection is a method of corrosion prevention used to safeguard assets as diverse as buried metallic piping, underground storage tanks, ships' hulls, and offshore oil-drilling structures.

Corrosion is essentially the rusting and wasting away of metal. It is a natural force that works to return a metal pipe to its original state as a metal oxide (for example, from iron to iron ore). The type of corrosion that affects water pipes is electrochemical corrosion, often called galvanic corrosion.

It occurs when two different metals are in contact with a conductive liquid, such as soil moisture, which contains dissolved minerals. These conditions result in a flow of electricity, in much the same way that current flows in a battery.

The current flows because of differences between two areas of metal. One area serves as an anode and the other as a cathode. For current to flow, there must be an electrolyte path from the one metal to the other, and a direct electrical contact between the two metals (in the case of a water pipe, that contact is the pipe itself).

Current through the electrolyte always flows from the anode to the cathode. Where current leaves the anode, small metal particles are dissolved into solution, causing pitting. The cathode does not corrode. In essence, cathodic protection is a way of turning the pipe into the cathode. This is done by attaching to the pipe a piece of metal — called a sacrificial anode — that is more electrically active than the pipe material. The galvanic current then exits from the sacrificial anode. The corrosion occurs there, and the pipe is protected.



Halifax uses ductile iron pipe for most open-trench replacements. Here, crew member Paul Corbett guides a pipe section.



Taylor Cook applies grease to help join two pipe sections.

“We use lining technology extensively here. We dig holes at 200-foot intervals and use a rack-and-bore system that drags a line full of prongs through the system that knocks nodules off the inside of the pipe and scrapes it clean. That’s followed by a high-pressure jet-spray cleaning.”

Jamie Hannam

Making the old new

“Once the pipe reaches the end of its service life, as measured by its structural integrity, it’s ready for replacement,” says Hannam. “Obviously, lengths of main with multiple leaks are prime suspects. We were traditionally inspecting pipe and replacing it at about 0.4 percent of the system per year. We’re now ramping that up to 0.8 percent for 2010, with an eventual goal of replacing one percent annually.”

The utility uses Class 52 ductile iron pipe supplied by the Canada Pipe Co. for replacement. Much of the work is open-trench replacement, although the utility has begun to examine the potential of trenchless technologies. In 2007, more than 6,000 feet of main was rehabilitated with Aqua-Pipe structural liner, a thermoset epoxy system from Sanexen Environmental Services Inc.

Trenchless pipe repair is not a high priority at this point because the utility is coordinating much of its replacement work with a large-scale street improvement program. Most of the pipe is buried a little more than 4 feet down, just below the frost line.

“We’re able to complete 90 percent of the water main renewal

program with streets already under construction, which reduces costs for both our program and for street construction,” says Hannam. “We go in just after the asphalt has been stripped from the street. At that point, they’ve already established a construction zone, so interruption of traffic flow is limited as well.”

The utility is also coordinating some of its renewal with construction of a large wastewater treatment system now under way, although there is less synergy between water main and wastewater pipe locations. Once complete, the wastewater system will be handed over to the HRWC to operate on the same independent model as the water utility.

Cleaning and lining

For structurally sound mains with performance problems, the utility engages in cleaning and lining. The biggest problem affecting pipe performance is tuberculation in pre-1950 cast iron pipe with a relatively rough interior surface that encourages microbiological growth. As the tuberculation increases, it gradually chokes off water pressure, reduces fire flows and vexes customers by tinging the water red.

“We use lining technology extensively here,” says Hannam. “We dig holes at 200-foot intervals and use a rack-and-bore system that drags a line full of prongs through the system that knocks nodules off the inside of the pipe and scrapes it clean. That’s followed by a high-pressure jet-spray cleaning.”

Once the pipe is clean, the utility resurfaces the interiors with air-cured, spray-on epoxy. Halifax Water lined about 15,000 feet of water main in 2004 using COPON Hycote 162 PWX epoxy liner from COPON Pipelinings, E. Wood Ltd. In 2006, about 9,500 feet of main were lined using Huntington

Waterline Epoxy Product #8001.

“Using these systems, we can line about 500 feet of main at a time,” says Hannam. “We’re also using CARUS 3250 water treatment chemical, a phosphate dry blend, on the water to discourage microbiological tuberculation and eliminate the redness from the water. It’s not as much about water quality as it is an aesthetic treatment for customers who don’t like to see red water when they’re doing the laundry.”

Protecting assets

For metal pipe that is in good condition from both a structural and performance perspective, the

utility uses cathodic protection to extend service life. More popular in Canada than in the United States at present, cathodic protection (see sidebar on previous page) spares water mains from exterior corrosion.

The soils in the area are moderately corrosive, and some lines have shown signs of exterior damage. The program involves welding a sacrificial anode, usually a 30-pound magnesium cylinder, to contacts on the main.

"We auger down and dig a hole about 6 inches in diameter to about a foot away from the main, and use a vacuum truck to remove the remaining soil," says Hannam. "The leads of the anode are arc-welded into place, and then the anode is lowered onto a bed of sand or limestone and buried."

Each length of main receives two anodes, but since cathodic protection relies on a continuous electrical connection between sections, the utility needs to take note of previous repairs that use neoprene gaskets and break the connection.

"We began our three-pronged

approach of replacement, rehabilitation and protection about 10 years ago, as a response to the needs of the system and of our customers," says Hannam.

"That became more formal about five years ago as we realized that these three activities were effectively addressing the major needs of the system. Halifax Regional Municipality continues to grow, and our assertive program is ensuring that the water system is in good shape to grow with it." ♦

MORE INFO:

- 432** **Canada Pipe Co. Ltd.**
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- 433** **Carus Corporation**
800/435-6856
www.caruscorporation.com
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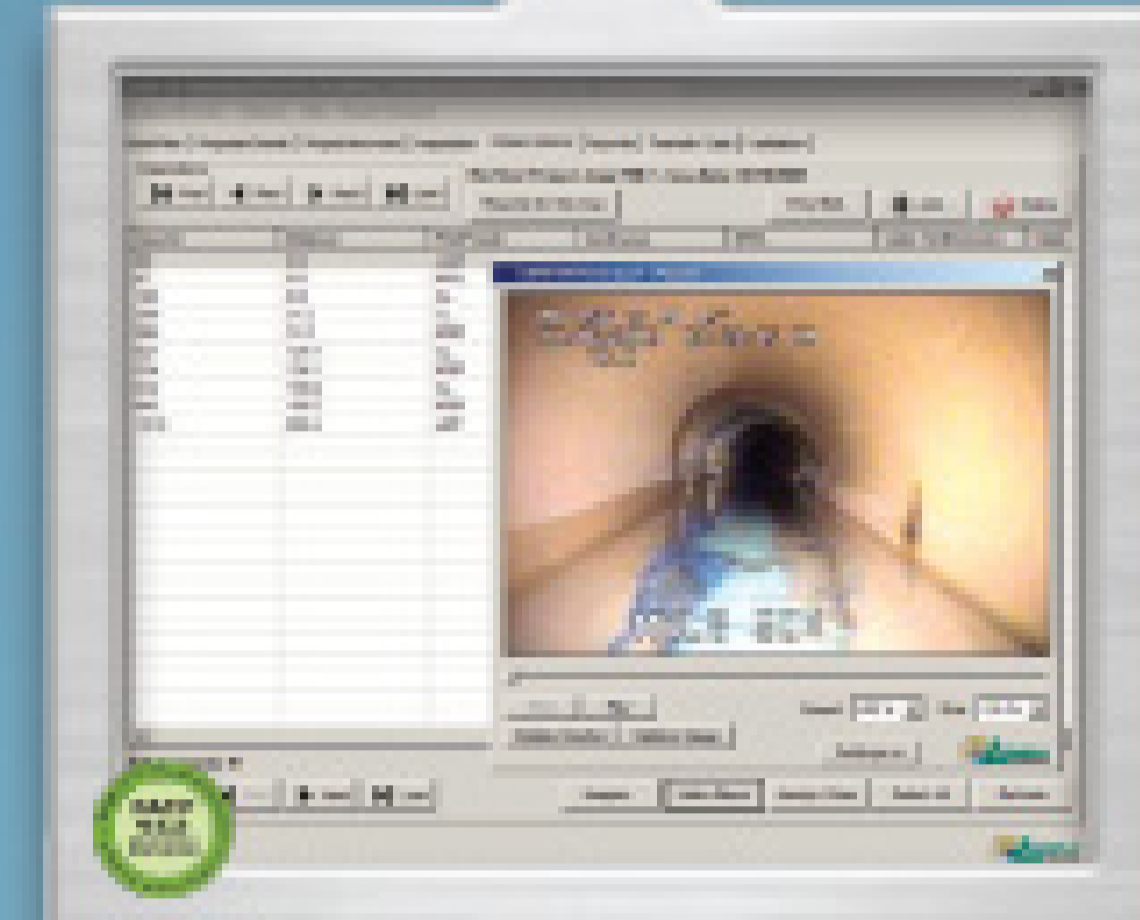
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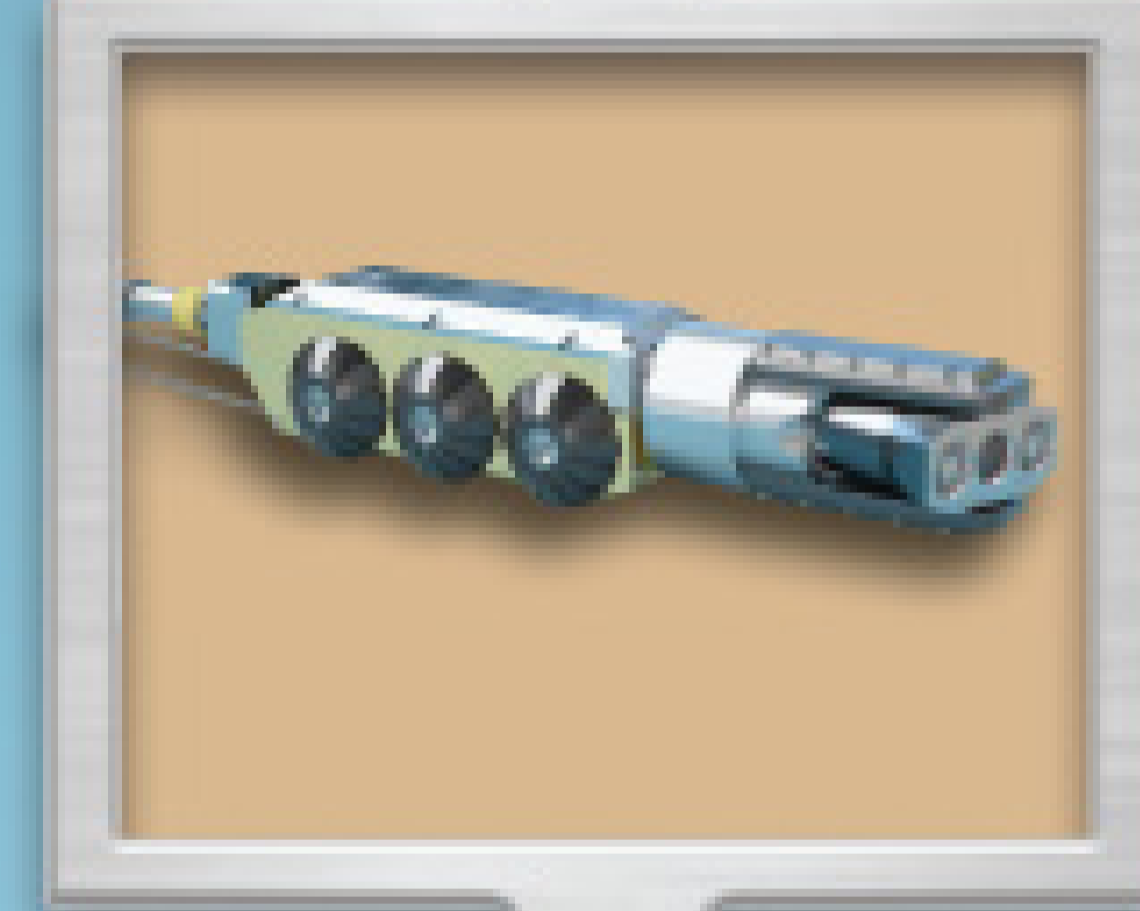
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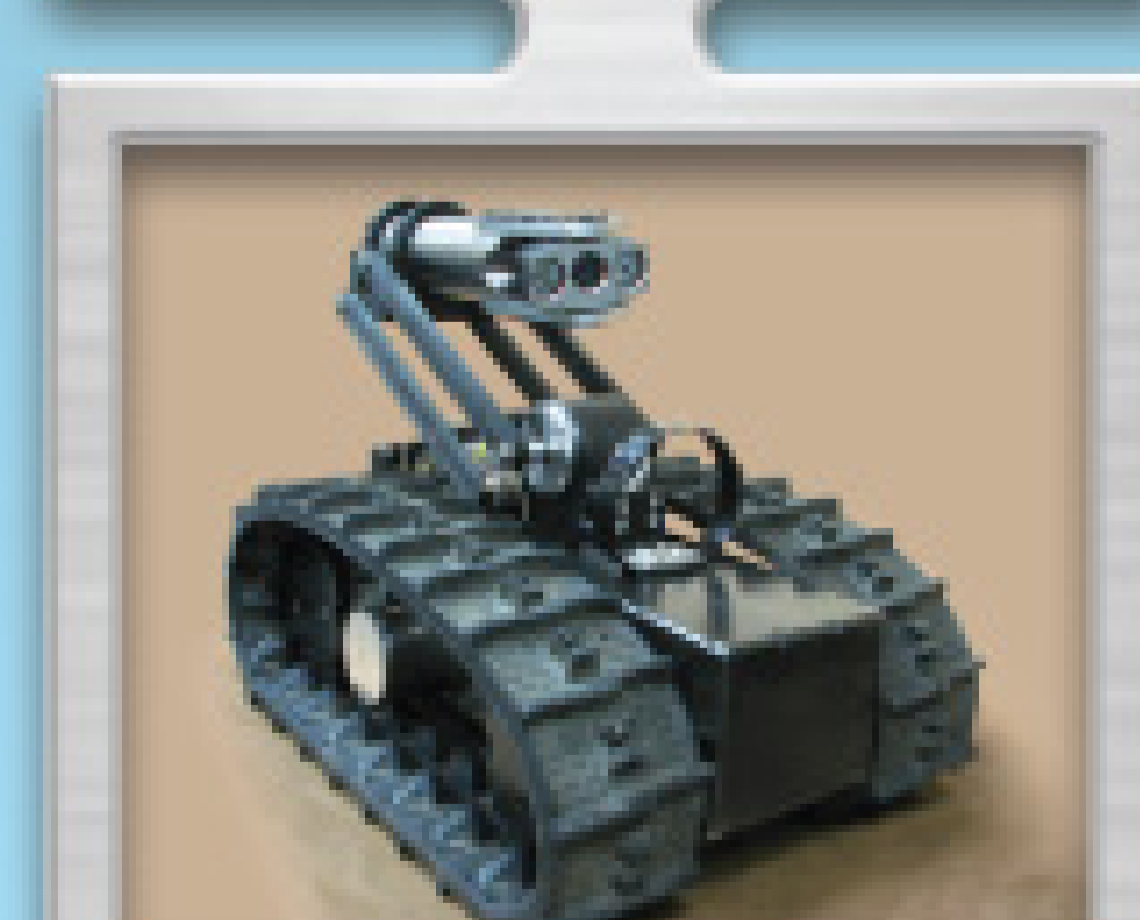
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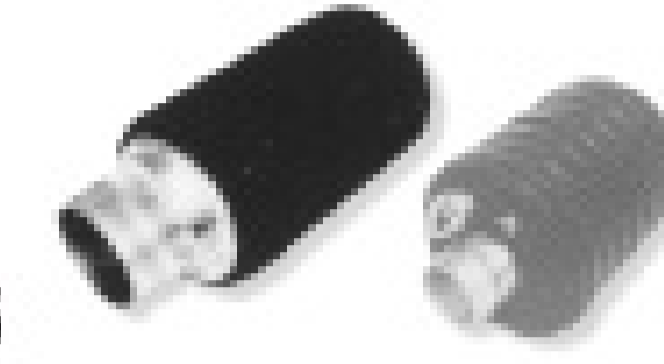
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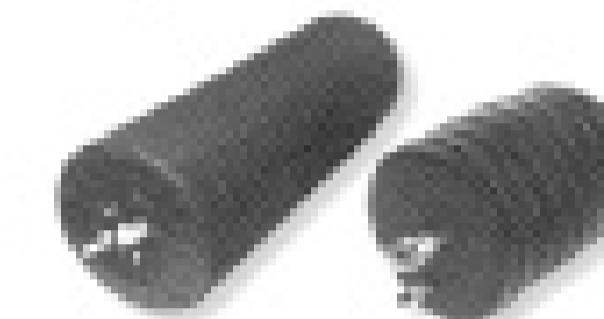
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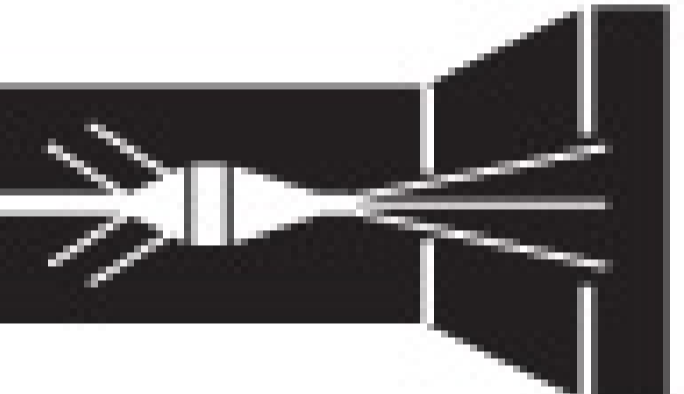
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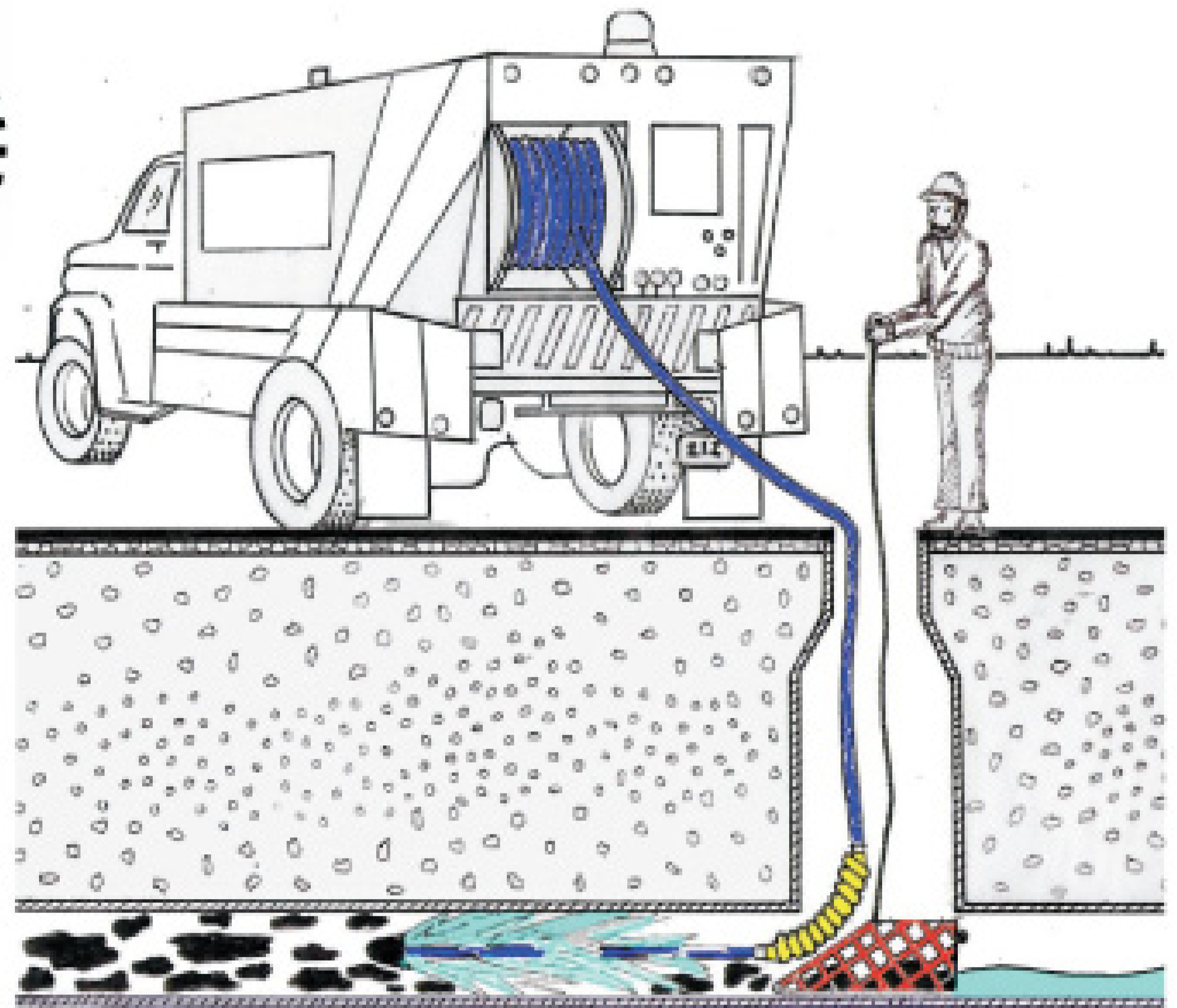
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Use Debris Catchers with Jet instead of Combo. Ideal where small amounts of debris are expected. Standard **MDC-6** model Comes with 20' of Poly Rope. Available from 6" to 24".



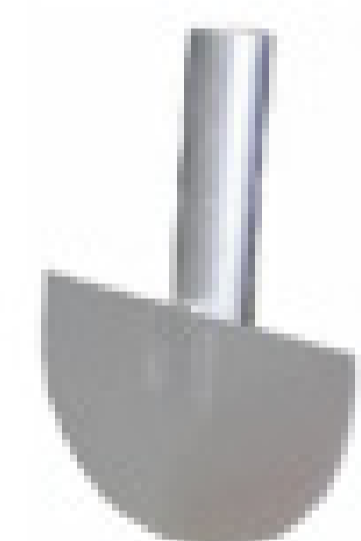
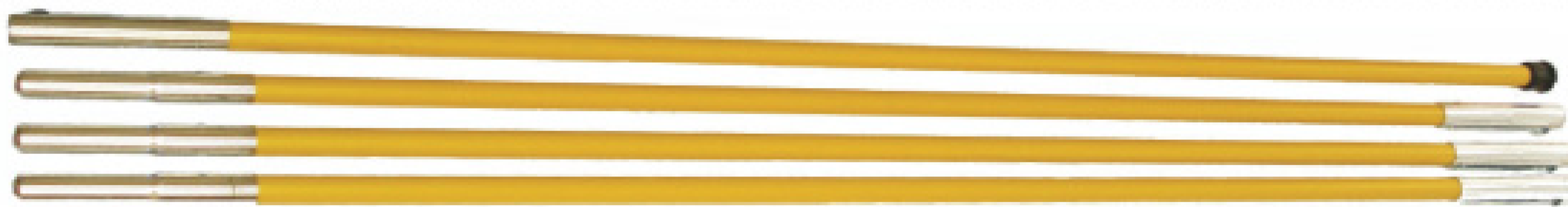
Grit Catchers

MDC-6CW are similar but have half moon bottom around sides and back to stop finer grit and black sand from Flowing thru. Fills with material faster.



MPF-24 Quick Connect Fiberglass Poles

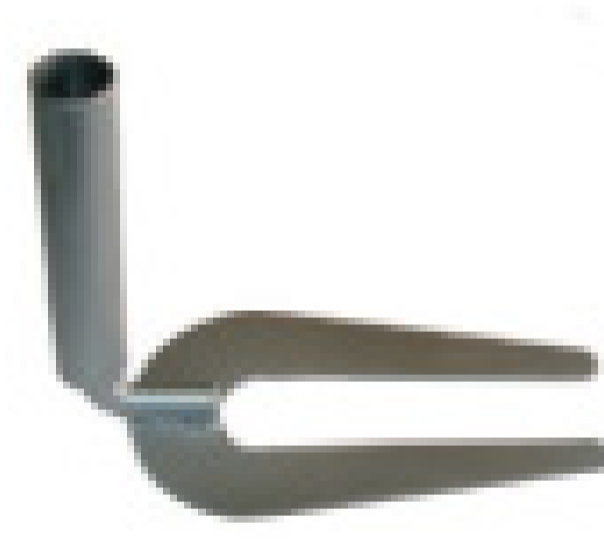
24' pole set used with above Tools and Debris Catchers. Each set Includes 3 ea. 6' male x female and 1 x 6' end pole. These are Light, Strong durable poles with positive lock Aluminum quick couplings. Other lengths available. Use with Debris and Grit Catchers and assortment of tools below.



MGLC-1
Grease Log Chopper. Blade cuts thru heavy pieces.



M3PG-1
Three Prong Grabber. Great for Rocks and Roots.



MHG-2
Horse-Shoe Grabber. Great guiding hose in and out of sewer lines.

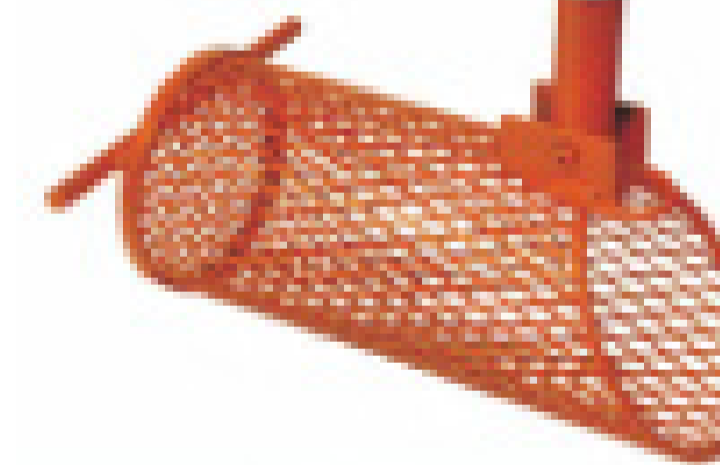


MDS-6
Debris Scoopers Heavy duty construction For 6", 8" and 10" Pipe sizes.



MCG-6
Grit Basket. For use with poles or rope. In sizes from 6" to 24".

Debris Catcher



Grit Catcher



Debris Catchers and Grit Catchers both can be used with any length of Fiberglass Poles. Provides for positive action of positioning, raising and/or lowering these catchers in manholes.

MCLAW MAX-CLAW 7' -15' Telescopic Extendable Claw with fiberglass pole extension spring loaded end Claw for Heavy duty retrieval. Jaws stay open and positive rope pull locking systems assure you wont loose your debris.

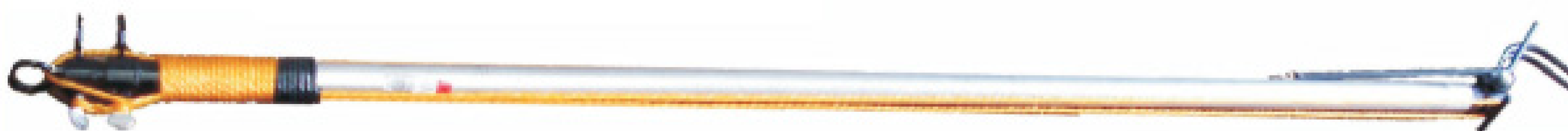


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Knock down design, easily assembled from 6' to 25'. One size can be used in different lengths. Ships via UPS, Now you don't have to pay those high trucking charges



MDG-1 DEBRIS GRABBER 5' -15' Telescopic Extendable Debris Grabber with Steel body construction and articulating end fork. Rope opens and closes jaws for positive grabbing.



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Exhibit floor at the 2009
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2009 EXPO

READY FOR DUTY

Optimism pervades the exhibit hall as Pumper & Cleaner Expo attendees discover the latest technologies for municipal pipe cleaning, repair and maintenance

By Ted J. Rulseh

The 29th Annual Pumper & Cleaner Environmental Expo International drew an optimistic crowd to the Kentucky Exposition Center Feb. 25-28.

While the economy may have kept some visitors away, the event drew representatives from 3,780 organizations and a total of 8,868 attendees. The prevailing attitude was that the industry will endure, and that no matter what may be happening in the financial sector, there is work to be done in the streets.

Attendees visited 519 exhibits in more than 500,000 square feet of show space. Education Day seminars and additional seminars during exhibit hours on Thursday and Friday drew full meeting rooms.

There certainly has been no slowdown in manufacturers' innovation: Attendees discovered the usual wide array of new tools and technologies that make pipe cleaning, maintenance and rehabilitation easier and more effective. Here is a look at some highlights from the exhibit floor.



High-flow jetting

The **Hi-Flow Ultimate Warrior** water jetter from **Spartan Tool LLC** has a fully enclosed, sound-damping fiberglass body, a 3,000 psi/35 gpm pump, and a 180-degree pivoting hose reel with optional six-function remote control for ease of operation in tight quarters. A dual-axle configuration gives it a towable capacity of 600 gallons.

The jetter is designed for cleaning pipes from 4 to 36 inches. Standard hoses include 500 feet of 5/8-inch high-pressure cleaning hose, 100 feet of 5/8-inch rubber supply hose, 75 feet of 1/4-inch trap-cleaning hose, and 15 feet of color-coded leader hose. The unit weighs 4,955 pounds empty and 9,935 pounds full. It is powered by an 83 hp electronically controlled turbo diesel engine.

Marine-grade gauges and Dial-A-Pressure psi settings simplify operation. All controls move with the hose reel when the rear hatch is opened for operation. Call 800/435-3866 or visit www.spartantool.com.



Digging up a storm

The **Hydrovac** unit from **Tornado Technologies Inc.** has an integrated water tank and cyclone for reduced space, lower noise and freeze prevention. The CAT water pump delivers 10 to 25 gpm at up to 3,000 psi. The direct-driven positive displacement blower delivers 27 inches Hg vacuum. A three-stage filter design provides a high degree of filtration.

A 740,000 Btu/hr boiler for working in frozen or compacted soils has an independent diagnostic system and thermostatic control. The electrical panel records blower, boiler and pump hours individually.

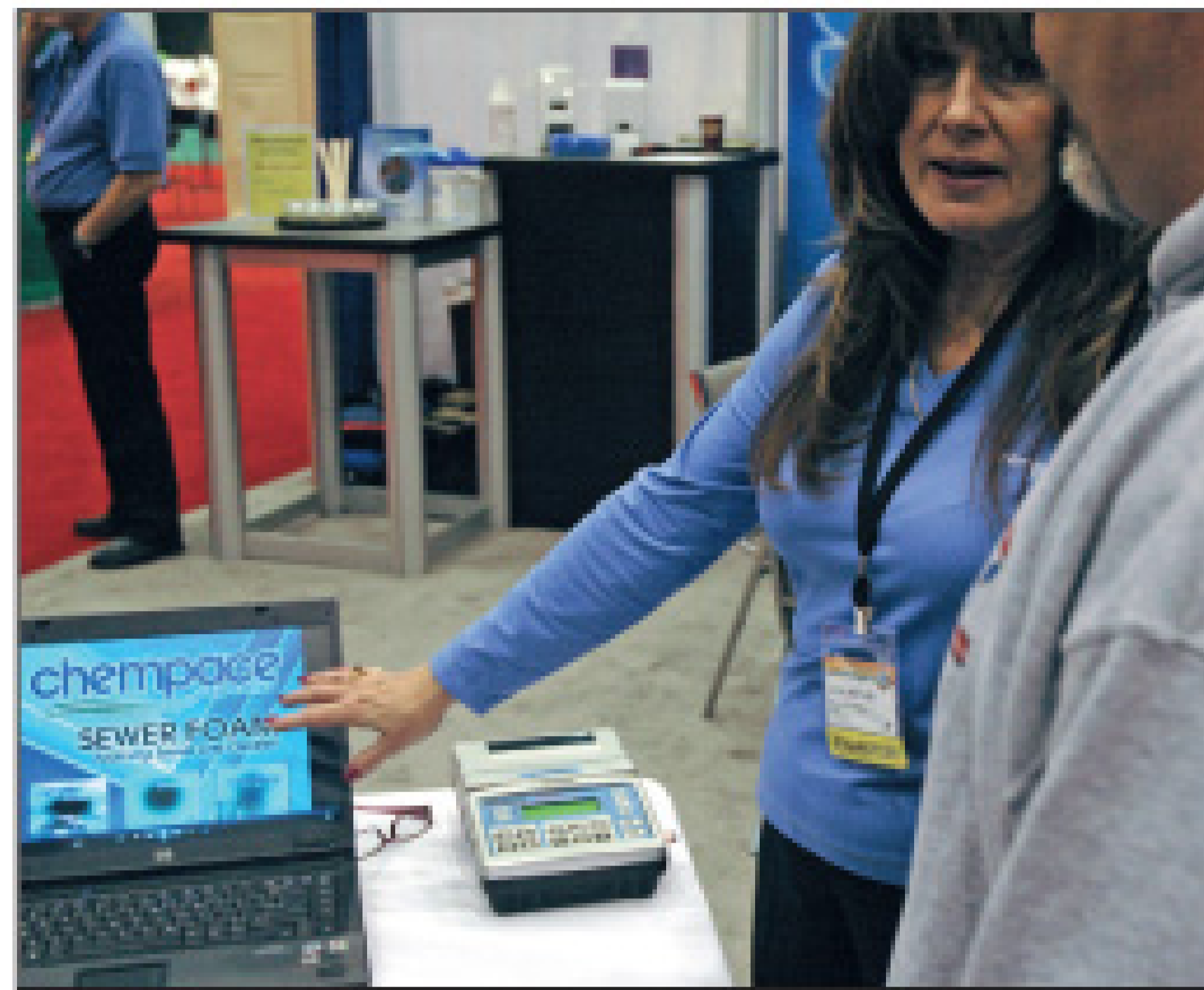
A head-mounted boom allows 342-degree rotation and a 26-foot stretch. The 48-inch dump door has a hydraulic gate for fast unloading. A hydraulic mud sweep pushes with 50,000 pounds of force to move any size debris. Water and debris have separate chambers, both epoxy-coated for durability. Dual silencers reduce noise for working in urban areas. Call 403/244-3333 or visit www.tornadotrucks.com.



Locating for all materials

The **Innspector 07** locator from **Subsurface Instruments** locates utilities of virtually any material to depths of 10 to 12 feet. The self-contained unit weighs less than 2.5 pounds and requires no setup clamps or cables. It works in clay soils and is unaffected by moisture or salinity.

The unit can locate metallic or nonmetallic pipes and cables and almost any object — including septic tanks; graves, vaults and skeletons; buried walls and foundations; concrete storm sewer pipes, rebar in concrete, and water pipes in concrete floors. **Call 920/328-8066 or visit www.ssilocators.com.**



Sewer foam

Sewer Foam from **Chempace Corp.** is designed to reduce the solids and hydrogen sulfide odors caused by naturally occurring bacteria in sewer lines. The foam works by removing the organics in the line on which bacteria feed. It can be used during sewer line maintenance by adding one to two gallons of cleaner per 100 gallons of water. Available in 5-gallon pails or 55-gallon drums, the foam is applied while jetting up the line, then waiting five to 30 minutes, depending on conditions, and dosing on the way out. **Call 800/423-5350 or visit www.chempace.com.**



Enhanced combination cleaning

The **Vector 2100 Plus** combination truck from **Vector Manufacturing** adds new functionality to a proven cleaning platform. A new IntelliView control combines all functions into a single centrally located system that provides diagnostics, keeps operators from changing settings in ways that could compromise safety, helps operators locate machine errors, and provides a troubleshooting tool to diagnose fault codes quickly.

The hose reel, nozzle storage, toolboxes and controls are front-mounted for quick access. A pivoting control arm and rotating hose reel create a flexible and expansive work area. The fully hydraulic boom rotates up to 180 degrees. The hose reel telescopes forward and back up to 15 inches to allow cleaning of multiple inlets without moving the truck. Twist-and-lock pipe storage makes it easy to load and unload pipe.

Both centrifugal compressor and positive displacement models are available. A multi-flow system lets users set water flow at lower rpm to save fuel while increasing cleaning effectiveness. A repositioned water fill simplifies refills. A new debris body design shields the operator from potential contamination and allows maximum separation of materials in a variety of payload offerings.

Enhanced centrifugal cyclones accommodate increased air routing performance and improve filtration. A 60-inch high-dump is standard. A Jet Rodder Water Pump uses a slow pump stroke to deliver maximum continuous flow and pressure with minimal wear. **Call 815/672-3171 or visit www.vactor.com.**

(continued)



Vacuuming tools

The **GuzzlerGrip** line of industrial vacuum nozzles from **FS Solutions** is designed to enhance operator productivity and reduce fatigue. Handles are positioned for ease of use based on in-plant testing with cleaning professionals. Harnesses are designed to distribute nozzle weight optimally. Angled nozzle ends improve access to the material being vacuumed.

Tools include shovel-headed nozzles that vacuum material as it is loosened, backbone and long-reach versions for hard-to-reach locations, a pit-cleaning nozzle for vacuuming liquids from pits, and an easy-lift designed to relieve strain from long hours of vacuuming. **Call 800/822-8785 or visit www.fssolutionsgroup.com.**



Tank-cleaning tool

The **Torus 3-D** tool from **StoneAge Waterblast Tools** is designed for cleaning tanks in a full range of configurations. It handles pressures from 5,000 to 22,000 psi with a simple change of manifold and inlet coupling. Three manifolds handle flows from 17 to 80 gpm and can be easily interchanged.

While the tool is operating, the user can easily adjust the magnetic rotation speed to suit different applications. The operator simply adjusts a dial to decrease speed for difficult applications and increase speed for easier jobs. The unit comes with two sets of arms — 2 inches and 8 inches. Longer extensions are available. **Call 866/795-1586 or visit www.stoneagetools.com.**



Testing lines

The **hydrostatic line tester** from **Cam Spray** helps identify defects in pipes. The unit includes a 10.5 gpm/560 psi diaphragm pump driven by a 5 hp Honda GC engine. It has an easy-to-operate regulator and controls, a panel-mounted stainless steel line and bleeder valve, and dual pressure gauges.

The water system includes a 20-gallon tank, garden hose hookup, and overflow hose and tank bypass. The heavy-duty frame is powder-coated and has 13-inch pneumatic tires and swivel casters with brakes. The toolbox has quick couplers and adapters. A remote valve and gauge assembly allows for testing of lines away from the machine. **Call 880/648-5011 or visit www.camspray.com.**



Down the hole

The **Panorama SI** (shaft inspection) system from **RapidView IBAK North America** lets users inspect manholes and other structures up to 50 feet deep and from 16 inches to 10 feet in diameter in less than three minutes. The user sets up over the shaft, lowers a special camera to the bottom, and raises the camera back to the surface. There is no confined-space entry.

Once the camera has captured visual and geometric data, the user can analyze them using special software. Features include an "unfolded" side wall view for visual measurement and a 3-D model for verifying diameter and defects. Users can view any manhole feature anytime and from any angle. **Call 800/656-4225 or visit www.rapidview.com.**



Laser and sonar

A complete **pipe inspection package** from **CUES Inc.** combines laser profiling, sonar technology and a conventional camera on a float for large-diameter lines. The float is rated for 3,000 meters (9,840 feet) of travel in pipes from 60 to 138 inches that are one-fourth to three-fourths full.

Sonar detects and measures pipe bulges, records the shape and diameter of holes, measures obstructions and foreign objects, detects pipe ovality, and measures debris quantity and level. The FLYEYE laser profiler measures internal pipe conditions with accuracy within 0.1 percent. **Call 800/327-7791 or visit www.cuesinc.com.**



Inspection on the go

The **Portable Inspection System** from **Cobra Technologies** is designed to let users inspect anywhere with the full functionality of a truck-based system. The unit operates all Cobra crawlers with straight-line or pan-and-tilt and zoom cameras. It can be installed in a pickup truck, Jeep, Humvee or ATV, providing access to locations not easily reached with conventional equipment.

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The device has an ergonomic handle and all-terrain wheels for easy operation across any surface. The battery pack is portable and weatherproof. Selectable depth lets users survey utilities buried up to 26.5 feet. Call 877/247-3797 or visit www.pearpoint.com. ♦

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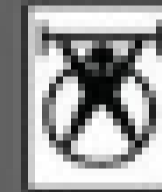
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The ESMD crew installs the launching device for an LMK liner to seal a troublesome connection under an electric transmission tower. (Photos courtesy of the Environmental Services/Maintenance Division)

WHERE THE COOKIE CRUMBLED

A cured-in-place-pipe spot-liner system saves the City of Tacoma, Wash., substantial time and inconvenience on a challenging sewer main repair

By *Scottie Dayton*

A 2 1/2-foot-deep sink-hole, 3 feet square, developed in Tacoma, Wash., when soil eroded under a 115-kV transmission tower after a cookie failed in a 10-inch sewer main. The city's Environmental Services/Maintenance Division (ESMD) had to seal the connection before erosion threatened the tower's stability.

Hugh Messer, assistant division manager, called Tacoma Power in preparation for excavation. "They

gave me a rough estimate of \$100,000 to erect a temporary power pole, remove the tower, pour a new foundation after we repaired the pipe, rebuild the tower, and re-rig the dual power lines," he says. "It would take three to four weeks."

Earlier, ESMD had purchased the Mainliner cured-in-place point repair system from LMK Enterprises Inc. in Ottawa, Ill. Messer wondered if it could replace the failed cookie. Cookies are wooden caps

covering extra connections installed in original lines in anticipation of future development. Although still learning the technology, Messer's crew sealed the troublesome connection and a previously unknown bad cookie in four hours.

Escalating expenses

Failed cookies are one of ESMD's transmission system issues. The division does its own excavations down to 20 feet, but doesn't use the spoil for backfill. "The sheer

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APPLICATION:

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USER:

City of Tacoma, Wash.

MANUFACTURER:

LMK Enterprises Inc., Ottawa, Ill.

CONTACT:

386/409-7332;

www.performanceliner.com

cost of hauling and disposing of the material, then backfilling with gravel to solve settling problems was crippling," says Messer. "Repairing cookies was a low priority. We'd wait until blown or rotten cookies released dirt and large rocks into the mains before fixing them." Excavating and capping connections could take up to one-and-a-half days.

The transmission towers run down a median strip separating the four lanes of North 41st Street. The 10-foot-deep sewer main lies directly below. Manholes, between the turn lanes, enabled the crew to keep traffic flowing, yet stay clear of it. "The city has a lot of issues with street repairs," says Messer. "Management liked the idea that we could repair the cookie manhole to manhole instead of tearing up the roadbed."

Besides the 28-foot turnkey trailer from LMK, Messer purchased a Yamaha Grizzly 350 ATV

that pulls a trailer carrying the air compressor and liner installation equipment. "We're hoping to buy the T-Liner system this year," he says. "The larger liners are heavy and difficult to pull in, so we'll use the ATV and avoid injuring someone's back."

Although LMK taught the men to enter manholes to position the inversion bladder, flexible launching device, hoses and cable in the

"We're always looking for opportunities to use the liner system. Compared with excavation, it has reduced our repair costs by 25 to 50 percent, and repairs are up to four times faster. Just the North 41st Street job paid for the LMK trailer."

Hugh Messer

pipe, Messer found that the division's portable, expandable hydraulic manhole shoring jacks with rollers allowed the crew to do the same thing from above ground.

"Eliminating confined-space entries is a big safety issue, and it saves time and money," says Messer. "The rollers enable us to pull our lines back and forth without chafing on the edge of the pipe." The ATV transports the shoring jacks, too.

Kit perfect

Messer purchased LMK kits with 6-foot-long, 10-inch textile-lined tube and premeasured resin and catalyst. While part of the five-man crew cleaned the section of pipe with a Vactor truck, Bill and Mike Smith wet out the liner in the LMK trailer. They hooked a vacuum hose on one end of the tube, poured the resin into the other end, and slowly kneaded it forward. "Vacuum impregnation removes all the air and draws resin into every fiber to produce a dense, uniform, cured-in-place pipe," says Messer.

Depending on ambient temperature, the resin cooks off in 90 minutes to two hours. Putting it into the on-board freezer extends the curing time. "Point repairs wet out

quickly and go in easily," says Messer.

The liner was packed into the inversion bladder, loaded onto the launching device, and centered in the pipe. A camera in front of the launching device allowed operator Steve Jackson to position it 3 feet from the connection. He then radioed Rose Ortiz to open the air valves. Pressure at 5 to 10 psi inverted the liner/bladder assembly as it rolled through the pipe.

Once it was inflated, Ortiz adjusted the valves until 2 to 4 psi held the liner against the host pipe while the resin cured. After removing the inflation bladder, Jackson verified with the camera that everything went well. "What's really nice about this system is that the resin fairs the edges of the liner so our jetting nozzles don't catch on it," says Messer. The ESMD crew now shoots 3-foot point repairs with confidence, no longer needing an additional 3 feet to compensate for inexperience.

Unending opportunities

Jackson spotted a bad cookie

on a dead-end connection coming off a side street into the North 41st Street main, so the crew repaired it, too. They left the intersection four hours later. "This technology enables us to fix anything quickly and cheaply," says Messer. "For example, we can do repairs deeper than 20 feet or under electrical vaults now. We save another \$20,000 to \$30,000 per job by not having to pull the vault."

The city also has old, cracked terra cotta mains. Instead of chasing the crumbling line to find a solid section, ESMD blows in a liner at the excavation and connects the replacement pipe to it.

"We're always looking for opportunities to use the liner system," says Messer. "Compared with excavation, it has reduced our repair costs by 25 to 50 percent, and repairs are up to four times faster. Just the North 41st Street job paid for the LMK trailer. That's a great advertisement to present to management." ♦

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Mike Blake stands behind the sinkhole that formed under the 115-kV transmission tower because of the faulty sewer pipe.

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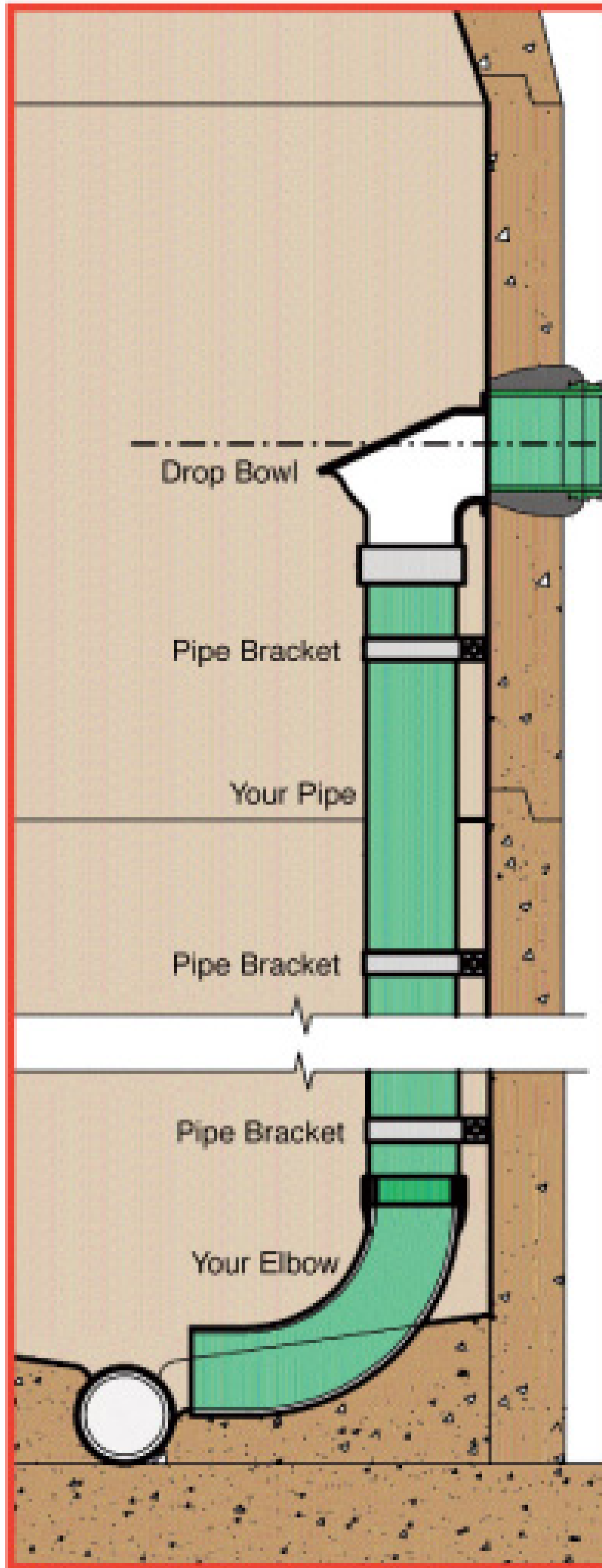
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FOCUS: SEWER

NO BIG DIG

A small New England community finds the solution to its inflow and infiltration issues through trenchless technology and a no-dig approach

By Suzan Marie Chin

As a suburb of Boston, Mass., the Town of Dedham was all too familiar with the pitfalls, disruption and enormous costs of infrastructure projects involving a “big dig.”

Not wishing to experience that firsthand, Dedham turned to trenchless technologies, especially cured-in-place pipe lining (CIPP), when looking for solutions to address its inflow and infiltration issues. A program of planned inspection, pipe cleaning, and follow-up rehabilitation with CIPP lining has significantly reduced I&I and as a result will bring savings in operational and wastewater treatment costs in the years ahead.

Dedham is one of 43 member communities of the Massachusetts Water Resources Association (MWRA), which treats wastewater for its members and rates their I&I percentages based on flow-metering studies. In 2003, Dedham ranked second for highest levels of non-sanitary flow into the treatment facility. Some 75 percent of the town's 4.04 mgd was attributed to I&I, and that heavily impacted the

sewage rates its residents paid.

Escalating rates and an outcry from town residents led the community to create a separate Engineering Department in 2005 to focus strictly on the underground infrastructure and capital improvement projects to reduce I&I and improve the overall performance and health of the wastewater collection system.

Knowing the score

“One of the first things we had to do to address I&I was to learn the real status of the sewer system,” says David Field, P.E., director of engineering. “None of the information existed in-house — it was with a private consultant. We didn't know what lines had been inspected or not inspected or what our situation truly was.”

Using the town's ESRI ArcMap geographic information system, Field and his department set to work compiling 2,300 inspection records, scanning them, and linking the scanned documents to the map database pipe segments. This created a list of which lines had been inspected and when, and told



Town of Dedham staff members David Field, P.E., director of engineering (left), and Ronald Lawrence, project engineer, locate a manhole and verify its location on the town's GIS using a Trimble GeoXH GPS unit with a Zephyr antenna and a wireless Panasonic Tough Book laptop. (Photography by Rick Karwan)



PROFILE:
Town of Dedham,
Mass., Engineering
Department

POPULATION SERVED:
23,000

INFRASTRUCTURE:
90 miles of sewer mains

EMPLOYEES:
4

ANNUAL BUDGET:
\$500,000 (operations)

WEB SITE:
www.dedham-ma.gov

diameter interceptor lines were built from brick and mortar.

The past inspections had been conducted for different reasons: some for an overall survey of system performance, and others to investigate trouble spots. In 2007, Dedham contracted for inspection of 32 miles of pipe by year's end. The aim was to provide a complete picture of the health of the sewers and manholes as the basis for an I&I remediation action plan. The inspection data was to be supplied

of heavy cleaning, the problem was resolved.

Throughout the inspection project, crews had to clean and inspect cross-country sewers, some which had received no attention since their installation because of steep grades or closeness to wetlands. An example was the Wigwam Brook line, an interceptor running between two main thoroughfares and through private property, including Ursuline Academy.

by Ursuline Academy was small, so to take advantage of the access roadway, we issued an emergency change order for the immediate CIPP lining of 1,997 linear feet of 12- and 15-inch vitrified clay pipe."

Because of the pipe's length, a sharp bend in one section, and limited access points, the town chose to install the lining in two 1,000-foot sections from a single access manhole in the middle. Within hours of the liner installation, the surrounding wetland water level rose by 1 to 2 feet, indicating the extent of the infiltration.

ing with the local consulting firm of Weston & Sampson Engineers Inc., began developing a comprehensive program to eliminate an estimated 1.2 million gpd of infiltration.

The town needed a cost-effective method to address the many trouble spots the inspections found. "The town had been dealing with

"One of the first things we had to do to address I&I was to learn the real status of the sewer system. None of the information existed in-house — it was with a private consultant. We didn't know what lines had been inspected or not inspected or what our situation truly was."

David Field, P.E.

in digital format utilizing the NASSCO PACP standard and would be integrated with the GIS database.

Repeat offenders

Among its findings, the inspection uncovered a blocked main barrel and a partially blocked emergency barrel in a siphon that had been the site of numerous sanitary sewer overflows. To address the issue, the town ordered the immediate heavy cleaning of the twin 10-inch siphon using a Vactor combination truck to clear both barrels. The remote location of the line required the contractor to use a small boat to access the downstream chamber. After two weeks

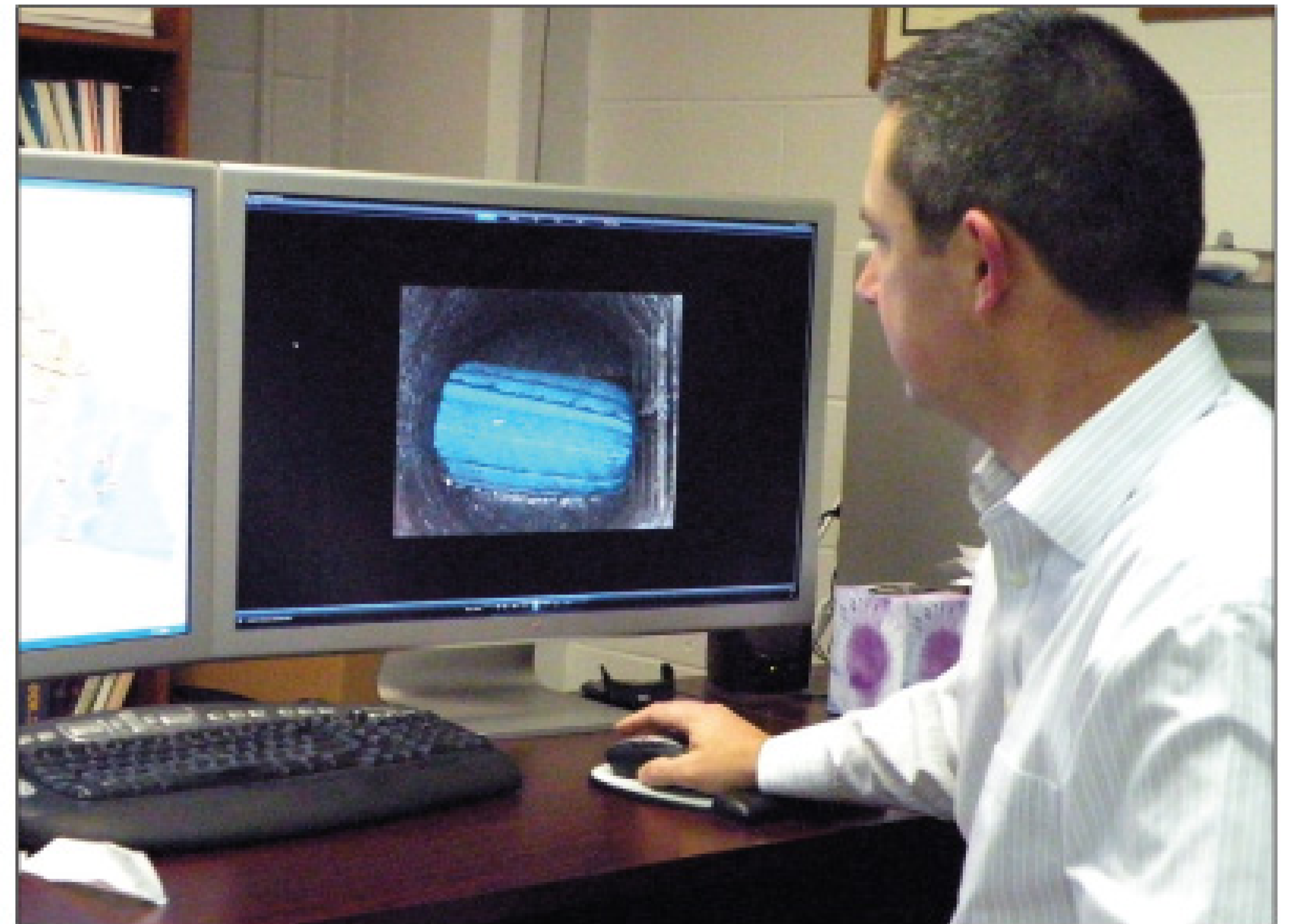
To inspect the pipe, the town had to secure permission from the academy and seek approval from the Dedham Conservation Commission to create a temporary access road through an adjacent wetland area and across a small stream.

In the end, the contractor found that the line was subject to significant infiltration even during a drought in which most of the wetland was dry. "Although the design of our infiltration reduction plan was not complete, at that point we knew we probably would have to use CIPP for the majority of our I&I rehabilitation repairs," says Field. "The inspection showed that the line was leaking like a sieve. The window of time allotted to us

No-dig approach

At the end of the inspection contract, Field and his team, work-

At right, a sample of clay pipe with CIPP lining. Below, David Field reviews a CIPP installation on a pipe inspection system.



FOG LIFTING

When the Town of Dedham, Mass., embarked on a CCTV inspection program of its wastewater collection system, its initial goal was to pinpoint the sources of I&I, which made up 75 percent of the sewage it was sending to the regional treatment plant.

The inspection also revealed the culprit behind many sanitary sewer overflow (SSO) hot spots and problem areas, which had been addressed by emergency reaction but never completely resolved.

"Before our new inspection program, the maintenance of our lines was very reactive," says David Field, P.E., director of engineering. "If a call came in, the team would take the jet truck out, clear the blockage and that was that. Now, we've compiled data and are tracking specific areas after cleaning with follow-up inspections. These activities and data are showing us precisely what the causes of the blockages are, whether it be fats, oils and grease (FOG),

debris or roots, and where the sources of these problems originate."

Now, when blockage issues caused by heavy grease deposits are discovered, Dedham contacts the establishments upstream to determine whether grease traps are installed as required and whether those systems are being maintained. If not, the owners are asked to come into compliance. The town also enlists the aid of the local Health Department to ensure that food and hospitality businesses maintain their grease traps regularly.

"We are receiving good response from our Board of Health now that we have the information available to make them aware of the FOG issues," says Field. "Through their aid, and by educating our property owners about how their activities affect our sewers, we've been very successful in reducing hot spots and emergency calls to relieve blockages caused by grease. We can now maintain our system on a proactive rather than reactive basis."

I&I primarily by open cut and replacement of sewer mains,” Field says. “They would do drainage lines, and they would repair sidewalks and perhaps construct a whole new street where they’d installed a new sewer main.

“That method is great when you have an unlimited budget,” he notes. “They had only been able to do a handful of those projects, because the cost was prohibitive, and there wasn’t much actual I&I benefit for the money. In my experience with inflow issues, trenchless technologies were much more cost-effective. The nature of our system lent itself well to CIPP, and

“In my experience with inflow issues, trenchless technologies were much more cost-effective. The nature of our system lent itself well to CIPP, and using that method would allow us to get a lot of I&I work done for dollars invested.”

David Field, P.E.

using that method would allow us to get a lot of I&I work done for dollars invested.”

Case in point: the Washington Street Sewer Replacement Project, designed before the Engineering Department was created and before the inspection program. The project called for open-cut and replacement of a line as deep as 30 feet in an existing street. When Field came on board, he examined the project carefully and saw that the open cut/replacement was not feasible without significant utility conflicts and other remediation risks.

The Engineering Department halted the project to review alternatives. An investigation found that CIPP lining would solve the problem and save the town over \$700,000. “The old mindset was that if a pipe was old, it had to be replaced,” says Field. “This project proved that trenchless technologies could save us money and limit disruption from weeks to days or hours.”

Bundling projects

As trenchless technologies proved to be the right solution,

Ronald Lawrence (left) aids Danny Fey, skilled equipment operator, in cleaning out a catch basin.

Field and the consulting engineers created a final project design that called for testing and sealing 48,356 linear feet of sewer main, testing and sealing 557 service connections, and installing 21,867 linear feet of CIPP liner. The work also included 1,146 linear feet of short liners and rehabilitation of 3,252 vertical feet of sewer manholes using QM-1s, spray-applied cementitious lining by Quadex Inc.

To help Dedham get the most from its budget, Weston & Sampson recommended bundling similar repairs, such as groups of manhole-to-manhole runs. This would help the contractors deploy crews cost-effectively and so generate lower bids. The installation of the manhole-to-manhole runs was awarded to Insituform Technologies Inc.

The same principle held true in deciding which lines to repair with short liners installed by National Water Main Cleaning Co., using an epoxy-based, impregnated polyurethane-coated felt tubing liner. “We look at their recommendations and tweak them to make sure we can address the most critical areas, especially some of our interceptors, which are the backbone of our system,” Field says.

As part of the program, Dedham also examines and tests every joint and service connection for airtightness. If a gap is found, chemical grout is applied to help stop water infiltration until a more permanent CIPP repair can be performed.

Funding for the project came partly from the MWRA and the balance from sewerage fees. Field notes that community support has been strong because of the department’s outreach and communication. Before all CIPP installations, the contractor delivers notices describing the work and asks residents and businesses to limit water usage while the liners are installed. Crews notify property owners one week in advance, 24 hours in advance, and again when the lining process is complete. Disruption to the property owner is usually limited to one day or less.

Proof positive

To date, Dedham rehabilitated



sources of most of the system’s 2.5 mgd of observed infiltration and has gone from second to ninth place on MWRA’s list of I&I contributors. The Engineering Department plans to re-inspect the entire system on an ongoing basis to continue to reduce and eliminate sources of I&I.

The program has also helped reduce day-to-day maintenance costs. As the inspection program has pinpointed root intrusions and grease that contribute to SSOs, the Public Works Department addresses those issues on a preventive basis. That reduces the number of emergency calls. All this work is documented electronically and linked to the GIS database.

“Our biggest challenge when we started was being faced with the unknown,” says Field. “Recreating the history of our system over the

last 20 years was a big obstacle. Now that we’ve compiled all the data into one central GIS system, we know where we stand and can manage our system more effectively. It will now be a lot easier going forward, and we’ll be able to bring down those I&I levels even further.” ♦

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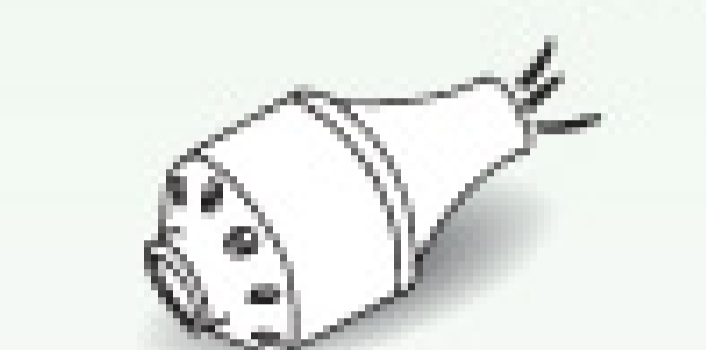


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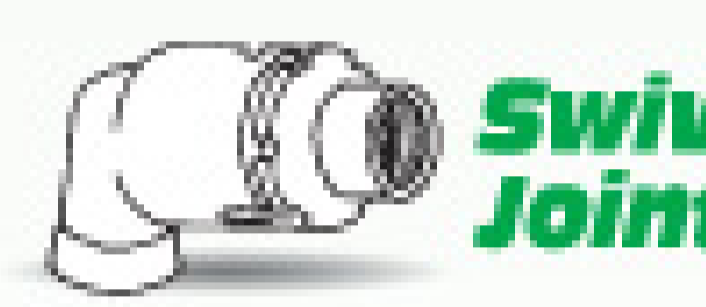
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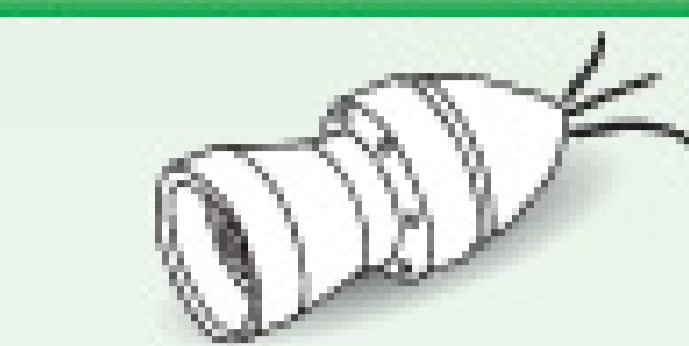
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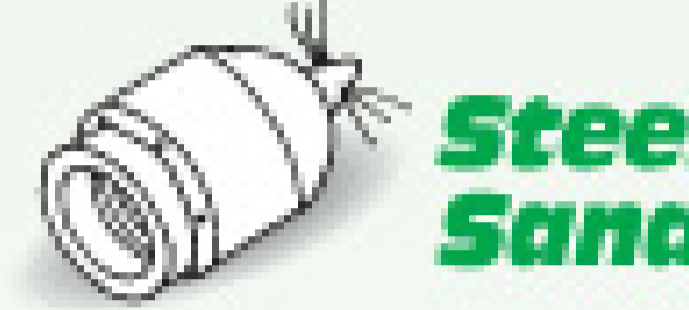
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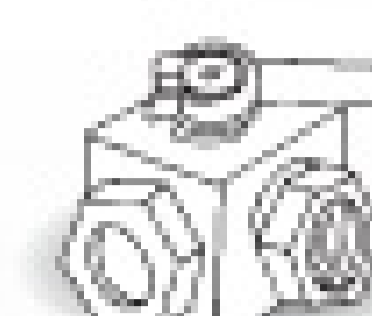
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December 2008

Controversial Water Plan

Escondido, Calif., is considering reclaiming wastewater to use as drinking water to augment its water supply. Utilities director Lori Vereker says that plan will avoid upgrades to the wastewater treatment plant and an ocean outfall pipe, saving the city hundreds of millions of dollars.

The three-step reclamation process would clean the water to irrigation standards, pass it through reverse osmosis to remove salt, and disinfect it with ultraviolet light and hydrogen peroxide. Pumped into a basin, the water percolates through the soil for six months before being used by the water utility. Tests at the Groundwater Replenishment System of the Orange County Water District show that the product is cleaner than drinking water drawn from the Colorado River.

Go Green, Save Money

A report, *Clean Water, Green Jobs*, released last month by a group of Ontario municipal water management experts and environmentalists including the Forum for Leadership on Water (FLOW), states that its \$4.5 billion plan to repair aging water infrastructure with energy-efficient facilities could create at least 50,000 jobs.

The authors note that municipalities could save millions of dollars by improving water efficiency and reducing demand on treatment facilities. Municipalities have estimated they need about \$31 billion to return water and wastewater infrastructure to acceptable levels. In Ontario, the report estimates that increasing water efficiency by 20 percent would save enough electricity to power 95 percent of homes in Toronto for a year. Visit www.waterdsm.org/pdf/Fed%20water%20stimulus%20Dec%202008_final.pdf.

A Grade of "D"

The American Society for Civil Engineers assigned the nation's infrastructure a grade of D in the *2009 Report Card for America's Infrastructure*. It is the same overall grade as in 2005, but the report showed a significant increase in the funds needed to restore the infrastructure. It concludes that \$2.2 trillion in repairs and upgrades is needed over the next five years. Visit www.asce.org.

Revitalize, Reinvest, Renew

National Public Works Week is May 17-23, and the theme is "Revitalize, Reinvest, Renew." The event seeks to enhance the prestige of public works professionals. The American Public Works Association encourages public works agencies and staffs to make their stories known through parades, displays of public works equipment, high school essay contests, open houses, programs for civic organizations, and media events. Visit www.apwa.net.

Only Tap Water Delivers

Drinking Water Week is May 3-9. Its "Only Tap Water Delivers" campaign helps utilities and officials communicate the value of tap water service and the need to reinvest in water infrastructure. Anyone can download handouts, children's activities, artwork, and logos from the American Water Works Association Web site. Visitors also will find suggestions on how to promote the campaign. Visit www.awwa.org.

Mantua AWWA President-Elect

The American Water Works Association (AWWA) Board of Directors named Joe Mantua, project manager at Black & Veatch Corp., its president-elect. Mantua, a 24-year veteran of the water industry, was in charge of development services for the Washington Suburban Sanitary Commission.

The board also selected Charlie Anderson and Debra Kaye as vice presidents and Marie Pearthree as director-at-large. Anderson, who retired as the director of utilities and deputy city manager of Arlington, Texas, now works for Camp Dresser & McKee. Kaye owns Kayepability Consulting in La Quinta, Calif., and Pearthree works for CH2M Hill.

CALENDAR

May 4-6

American Water Resources Association Spring Conference, Marriott, Anchorage, Alaska. Call Michael Lilly at 907/479-8891 or visit www.awra.org.

May 5-7

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

June 7-10

PennTec Annual Conference, Lancaster Host Conference Center, Lancaster, Pa. Call Cindy Rock at 570/549-2204 or visit www.pwea.org.

June 14-18

American Water Works Association Conference and Exposition, San Diego (Calif.) Convention Center. Call 800/926-7337 or visit www.awwa.org.

June 17-19

Florida Stormwater Association Conference and Exhibits, Sanibel Harbour Resort and Spa. Call 888/221-3124 or visit www.florida-stormwater.org.

June 21-24

American Society of Agricultural and Biological Engineers International Meeting, Grand Sierra Resort and Casino, Reno, Nev. Call Sharon McKnight at 269/428-6333 or visit www.asabe.org.

June 29-July 1

American Water Resources Association Summer Specialty Conference, Snowbird Ski and Summer Resort, Snowbird, Utah. Call 540/687-8390 or visit www.awra.org.

Aug. 16-20

StormCon, the North American Surface Water Quality Conference and Exposition, Anaheim (Calif.) Marriott. Call Steve Di Giorgi at 805/682-1300, ext. 129, or visit www.StormCon.com.

LEARNING OPPORTUNITIES

Household Sewage Study

Contributions of Household Chemicals to Sewage and Their Relevance to Municipal Wastewater Systems and the Environment identifies organic compounds that may be present in municipal wastewater. Published by the Water Environment Research Foundation, the study selects compounds by examining volume production, consumption pattern, and physicochemical properties.

Researchers developed quantitative structure activity and property relationships that can model the behavior of compounds through treatment processes. The report has a database of HPV chemicals and organic compounds found in household commodities. Visit www.werf.org.

University of Wisconsin-Madison Courses

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

- April 2-3 – Drainage Engineering Fundamentals for Non-Engineers (K347), Las Vegas, Nev.
- April 20-21 – Mastering the Fundamentals of Culvert Hydraulic Design (J966)
- April 22-23 – Implementing Effective Culvert Maintenance (J967)
- April 27-28 – Pumping Equipment and Systems: Selecting,

Operating, Maintaining, and Troubleshooting (K273)

- April 29-30 – Fleet Management (K326)
- May 7-8 – Preparing an Effective Municipal Capital Improvements Plan (K327)

Call 608/262-2061 or visit <http://cpdweb.engr.wisc.edu>.

Green stormwater management practices

The U.S. Environmental Protection Agency (EPA) and the U.S. Botanic Garden produced an online video, *Reduce Runoff: Slow It Down, Spread It Out, Soak It In*, that highlights rain gardens, green roofs, and rain barrels to help manage stormwater runoff. Watch the video online at www.epa.gov/owow/nps/lid/video.html.

American Public Works Association

APWA has these courses as classroom workshops or Web-based broadcasts:

- April 9 – Continuity of Operations – How to Stay on Top, Web
- May 5-7 – Public Fleet Management, Boston, Mass.
- May 6 – Public Infrastructure Inspector, Part 1, Web
- May 13 – Public Infrastructure Inspector, Part 2, Web
- June 3 – Public Fleet Manager, Part 1, Web
- June 10 – Public Fleet Manager, Part 2, Web
- June 17 – Public Fleet Manager, Part 3, Web

Call Carrie Merker at 800/848-2792 ext. 5213 or visit www.apwa.net.

American Water Works Association

The organization is offering these CEU/PDH seminars or Webcasts:

- May 6-7 – Water Demand and Conservation Management: Planning, Policy and Rates, Orlando, Fla.
- May 20-21 – Distribution System Assessment and Rehabilitation, Charlotte, N.C.

Call 800/926-7337 or visit www.awwa.org. ♦



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SOLUTION SELECTOR

Software from NASSCO helps users identify the trenchless technology best suited for specific pipe and work site conditions

By Erik Gunn

Trenchless technologies for replacing water and sewer pipes — lining, pipe bursting and others — have become well established. For prospective users, a key question is which trenchless technology is the most cost-effective for a given application.

The National Association of Sewer Service Companies (NASSCO), with the Trenchless Technology Center at Louisiana Tech University, has stepped in with the Trenchless Assessment Guide for Rehabilitation software (TAG-R).

The software provides guidance in the decision-making process. By entering specific variables related to

a particular trenchless project, users can generate a list of alternative technologies best suited to the task.

While far more complex and sophisticated, the software is roughly analogous to online utilities such as mortgage calculators that output a monthly payment when a user enters variables such as the principal and interest rate.

For demonstration, NASSCO provided a copy of TAG-R for an office computer equipped with the Microsoft Windows XP operating system. Once the software was installed, Gerry Muenchmeyer, technical director, illustrated the process of using TAG-R to choose a trenchless method.

Walk-around

TAG-R was installed from a standard Windows-type setup file that left behind a desktop shortcut to the application. The installation took less than 10 minutes. Once installed, the components, including a Microsoft Access database underlying the program, took up just over 116 megabytes of hard disk space.

Clicking on the shortcut icon first opened a dialogue box dis-

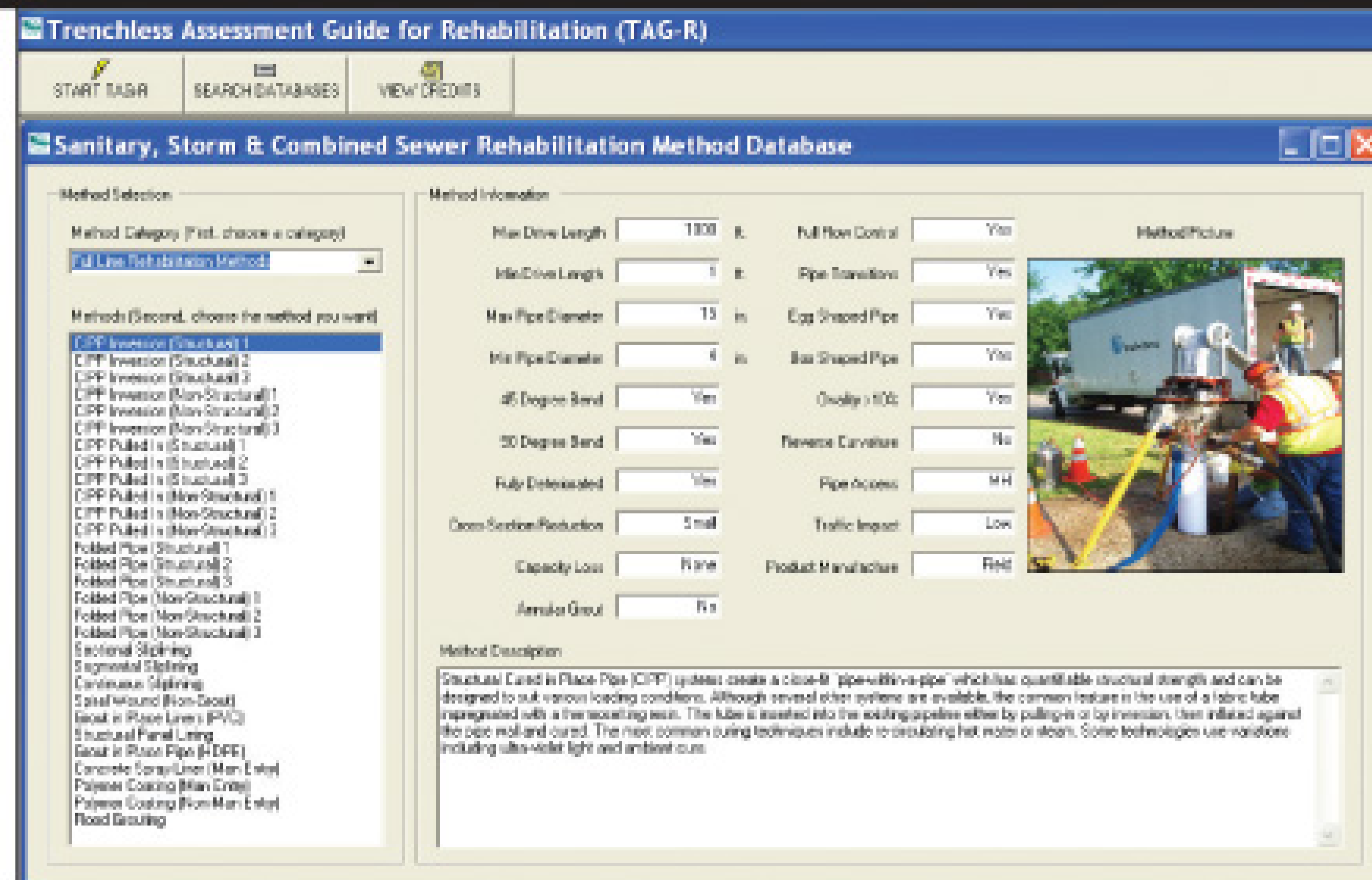


Figure 1. Database of trenchless technology options.

claiming any warranty for any system chosen as a result of using the program. A second disclaimer noted that the software “limits input data to those readily available to utility and municipal engineers at the design stage of a renewal project.”

The opening screen displayed three buttons in the top left corner of the window: Start TAG-R, Search Databases, and View Credits. The latter opened a window showing the NASSCO and Louisiana Tech logos and the names of the application developers.

The Search Databases button brought up a complete overview of the information stored in the TAG-R software. It opened a window offering a choice of four databases of rehabilitation methods:

- Sanitary, storm and combined sewers
- Lateral and connection seals
- Potable and nonpotable water lines
- Manholes.

Clicking on any of the database buttons led to a drop-down menu of sub-categories of types of projects. For instance, the sewer data-

TECHNOLOGY TEST DRIVE

PRODUCT:
Trenchless Assessment Guide for Rehabilitation (TAG-R) software

SUPPLIER:
National Association of Sewer Service Companies (NASSCO)

LOCATION OF DEMO:
Via telephone

DEMONSTRATED BY:
Gerry Muenchmeyer, NASSCO technical director

LIST PRICE:
\$100 for NASSCO members, \$195 for non-members

base menu offered a choice of full-line or spot-repair methods, and the water menu offered a choice of potable or nonpotable water methods. When the choice was made from the drop-down menu, the database showed all the methods suitable to that purpose, without taking into account any variables for the specific job.

The Start TAG-R button initiated a series of steps in which the project specifications were to be entered. The information entered enables

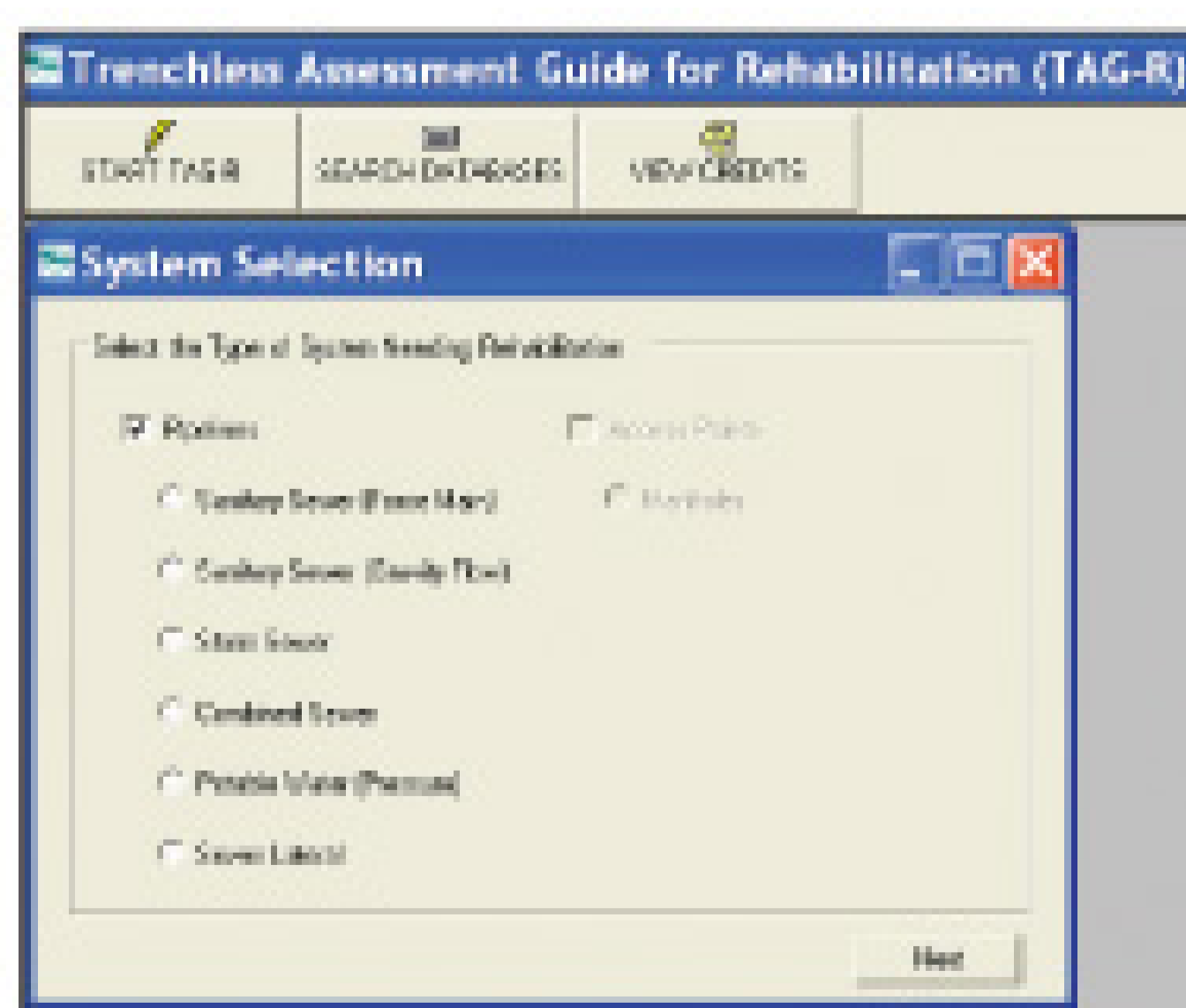


Figure 2. System Selection screen.

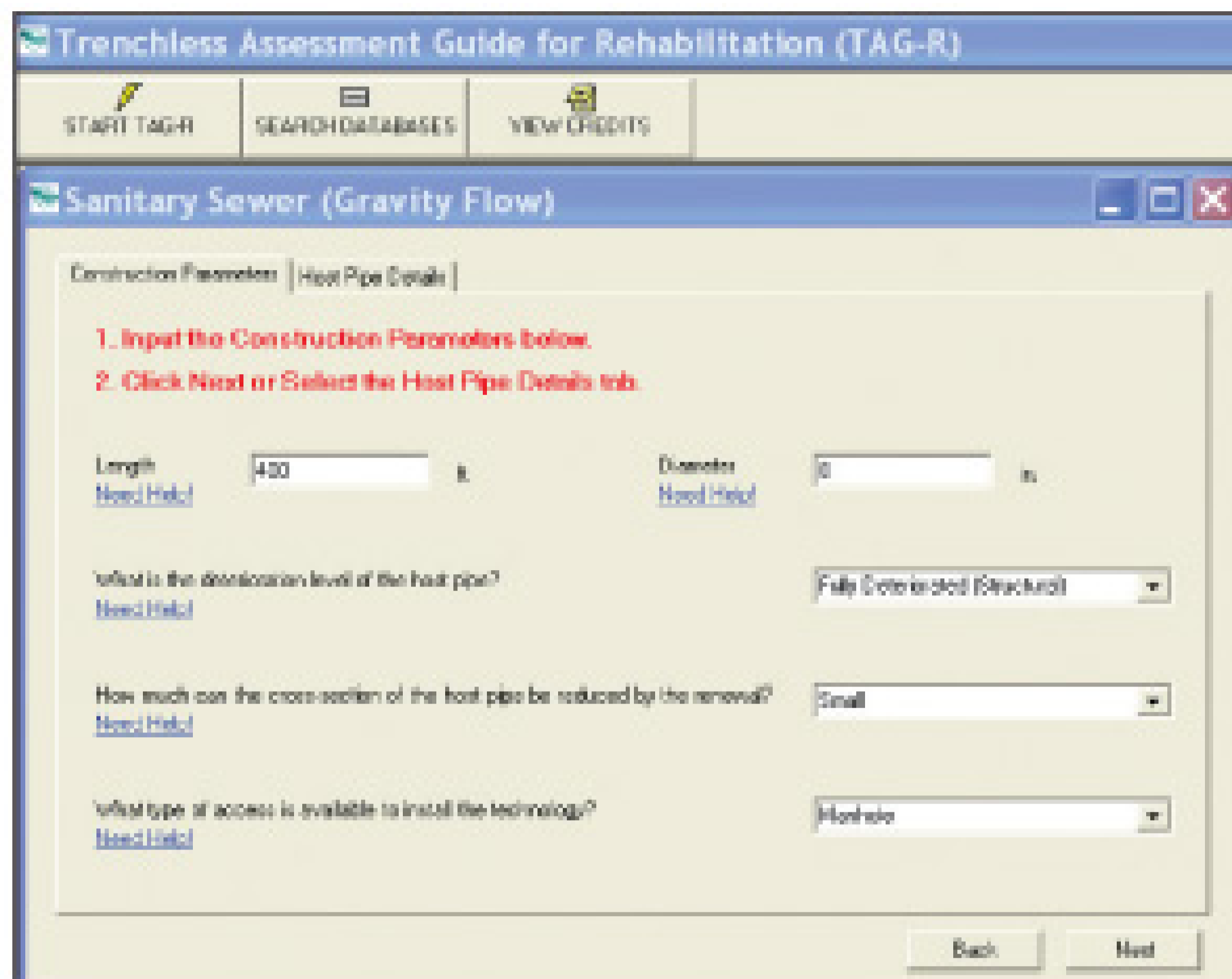


Figure 3. Gravity Flow Sewer screen with selection made under Construction Parameters tab.

the program to narrow the trenchless options to a short list of methods tailored to the project.

Operation

At Muenchmeyer's instruction, the software was started. On the software's opening screen, a click on the Search Databases button showed the entire list of technologies included in the software (Figure 1), grouped by various categories of projects listed in a drop-down menu.

Under a heading of Method Information, the tool displayed various minimum and maximum parameters under which each method can be used. Descriptions and a photograph of each process were included.

"If you don't want to run the program itself, you can get a lot of the information right here," Muenchmeyer said. However, under normal circumstances, it is unlikely that the operator would use the Search Databases view.

Closing the database window returned the view to the opening screen. The normal starting procedure would be to click the Start TAG-R button. Clicking on that button opened a new dialogue window, System Selection (Figure 2), offering initially two choices: Pipelines, and Access Points. Pipelines listed six alternatives:

- Sanitary sewer (force main)
- Sanitary sewer (gravity flow)

- Storm sewer
- Combined sewer
- Potable water (pressure)
- Sewer lateral.

To demonstrate the most common system for which trenchless rehabilitation is used, Muenchmeyer suggested checking the Pipelines box, then selecting sanitary sewer (gravity flow). Clicking on the Next button brought up a window showing two tabs: Construction Parameters in front and Host Pipe Details behind.

The software provides guidance in the decision-making process. By entering specific variables related to a particular trenchless project, users can generate a list of alternative technologies best suited to the task.

The front tab included five fields to be filled out. Two required numbers to be entered for pipe length (feet) and pipe diameter (inches). The other three had drop-down menus to select for deterioration level, the amount by which the pipe cross-section could be reduced, and the kind of access available to the line. For each item a Need Help button provided access to information explaining what data was to be entered for each field.

For the demonstration, 400 feet was selected for the length and 8 inches for the diameter (Figure 3). The drop-down menus for deteriora-

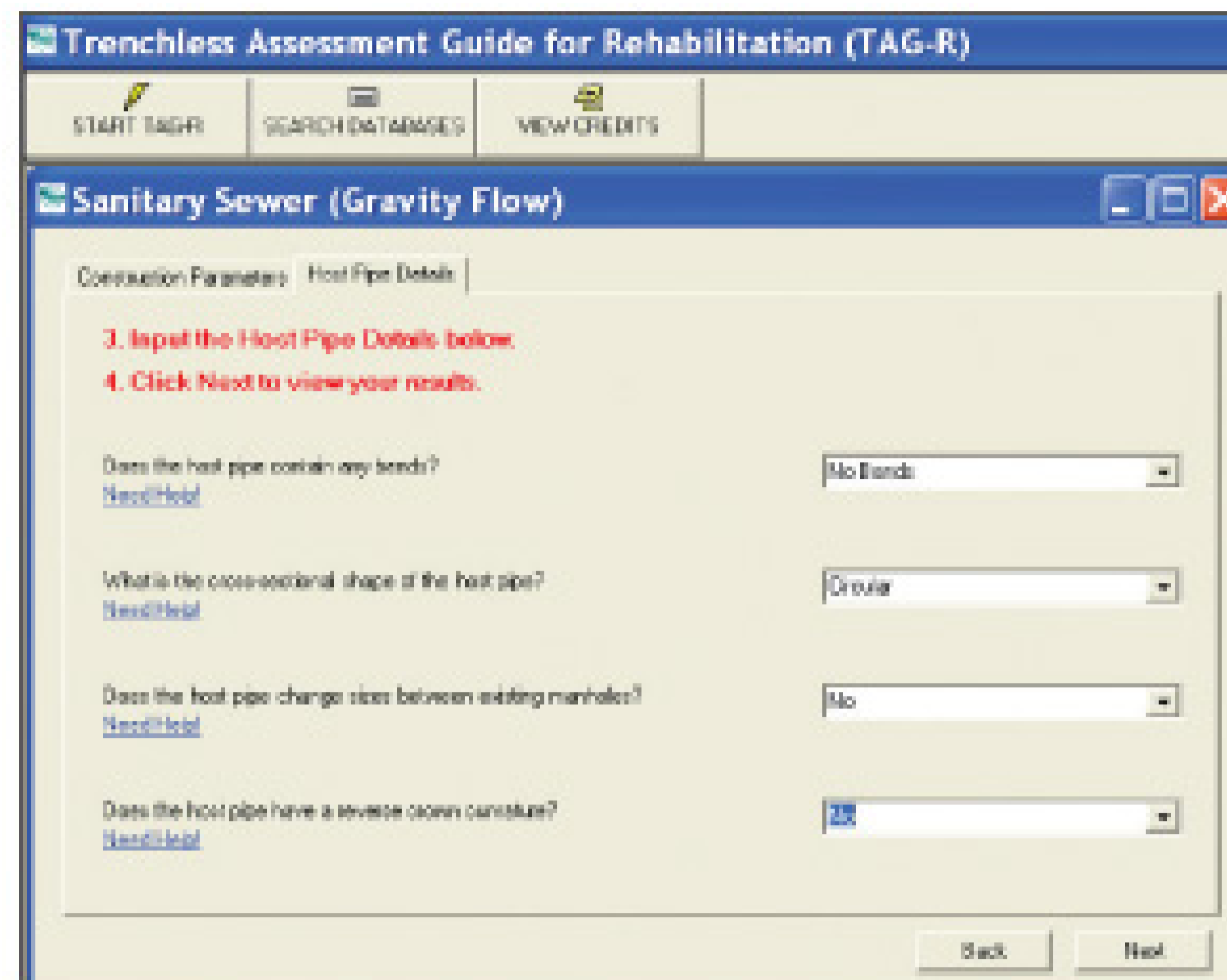


Figure 4. Gravity Flow Sewer screen with selections made under Host Pipe Details tab.

tion offered two choices based on ASTM standards: Fully Deteriorated and Partially Deteriorated.

Fully Deteriorated was selected. For the permissible cross-section reduction, Small was selected, and for access available, Manhole access only.

Clicking Next opened the host pipe tab with four drop-down menus for whether the pipe contained bends; its cross-sectional shape (circular or box); whether it changed size; and whether it con-

tained reverse crown curvature. The options for no bends, circular shape, no change in size, and no reverse crown curvature were selected (Figure 4).

Clicking Next led to a screen with a limited list of technology choices — in this case four: CIPP Inversion, CIPP Pulled in Place, Folded Pipe, and Spiral Wound. Clicking on any of these produced details from the application database (Figure 5).

Muenchmeyer then repeated the process, this time directing the choice of other options: a storm sewer, 300 feet, 24-inch diameter. In this example, selections were Fully Deteriorated pipe and Small Cross-section Loss. Also chosen were Either (access pit or manhole access), No Bends, and Circular cross-section, no size change and no reverse crown curvature.

The final list of technologies was the same. Muenchmeyer then backtracked to the question about cross-sectional loss and selected Medium. Now, in addition to the technologies suggested earlier, the final list of options included sectional slip lining, segmented slip lining, and continuous slip lining.

Observer comments

The application was intuitive and straightforward to use. One confusing moment occurred when the final list of options was presented in the storm sewer example: The

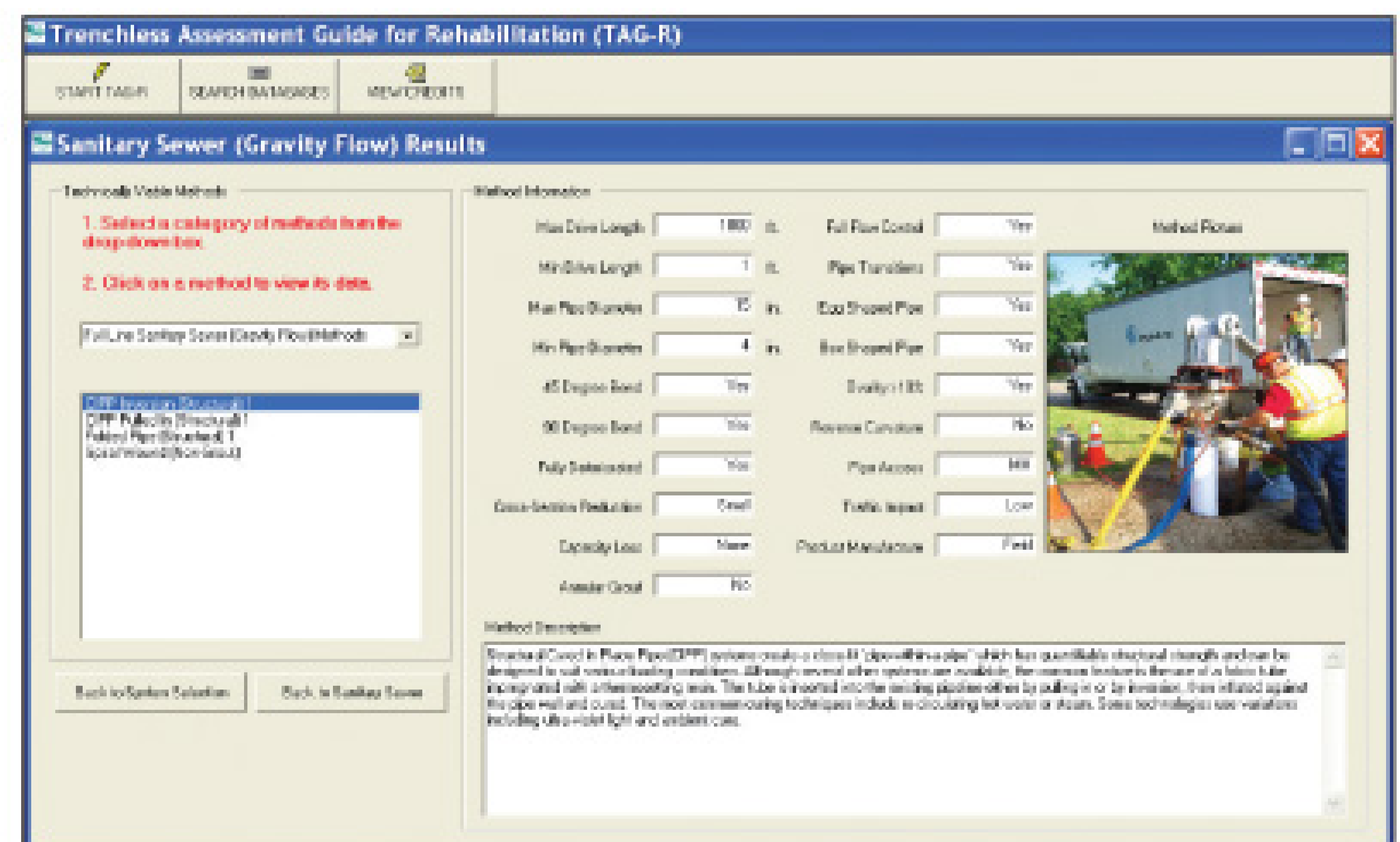


Figure 5. Results screen showing details from the application database.

category listed still showed Full Line Sanitary Sewer.

Supplier comments

Muenchmeyer acknowledged that some refinement could be made to avoid the confusing category listing on the final screen and explained that it occurred because both sanitary sewer and storm sewer options were drawn from a single database.

NASSCO markets TAG-R as a free-standing software application, but it also includes the software as part of its training program for trenchless inspection. The training program enables municipal engineers and allied professionals to obtain a certification to qualify as inspectors of trenchless projects.

Muenchmeyer notes that during its development, TAG-R was subjected to extensive peer review by experts in various trenchless technologies to ensure that the

database accurately reflected the full capabilities of each system and that it did not unfairly favor certain technologies over others.

He also observes that use of the software is only a first step in selecting a technology. "We evaluated putting risk factors in as part of the selection criteria," he says. "We ultimately eliminated that because risk is really the contractor's decision."

Use of the software would be followed by a discussion with contractors over the finer points of each option, and then a design by engineers knowledgeable about the selected technology. The computer program "is not meant to design a project." ♦

MORE INFO:

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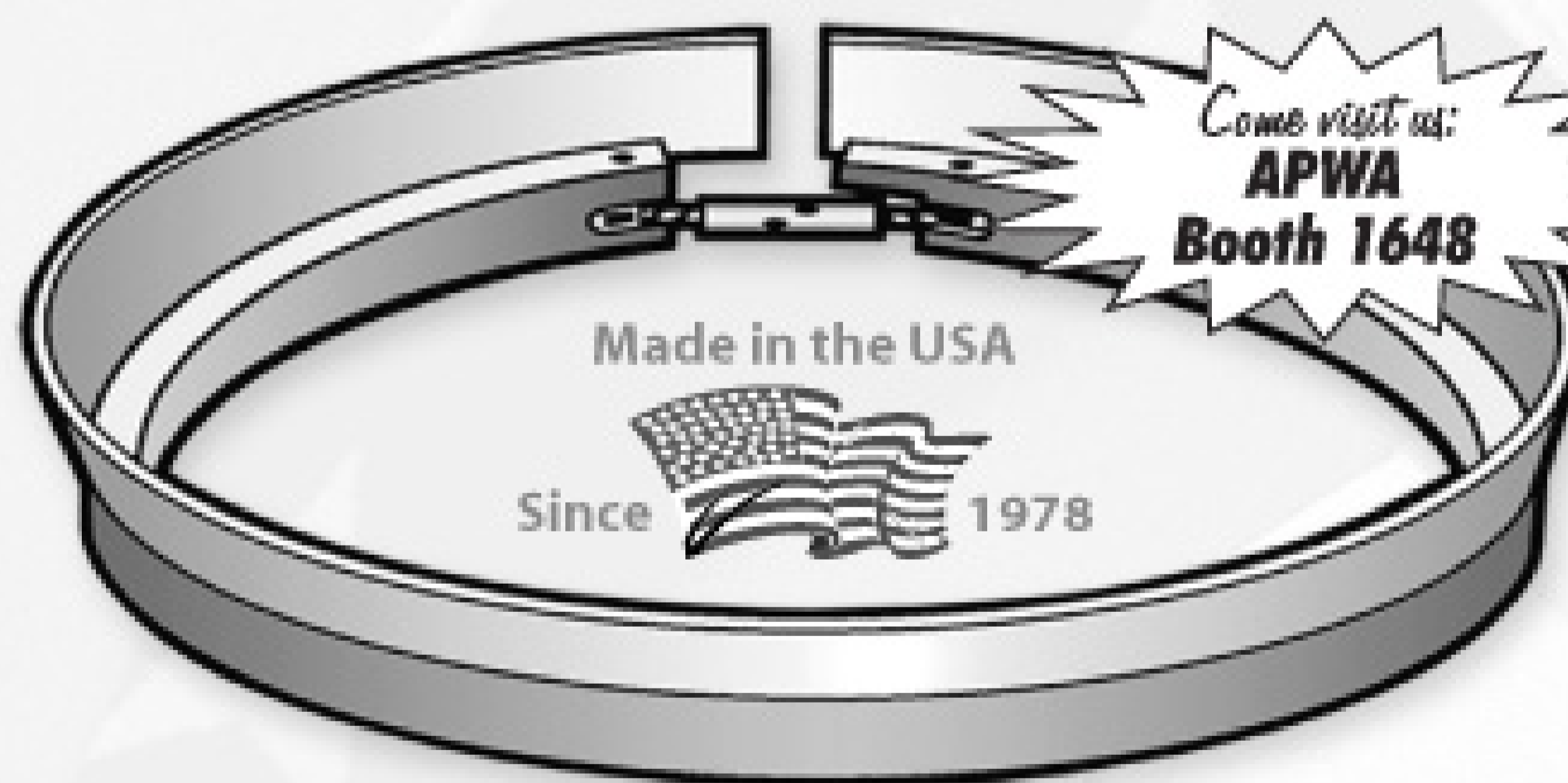


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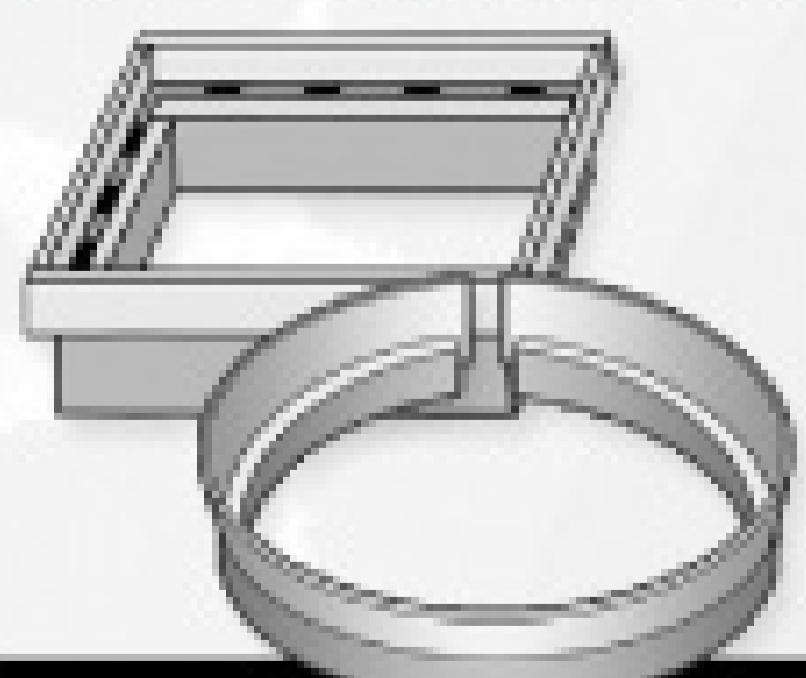
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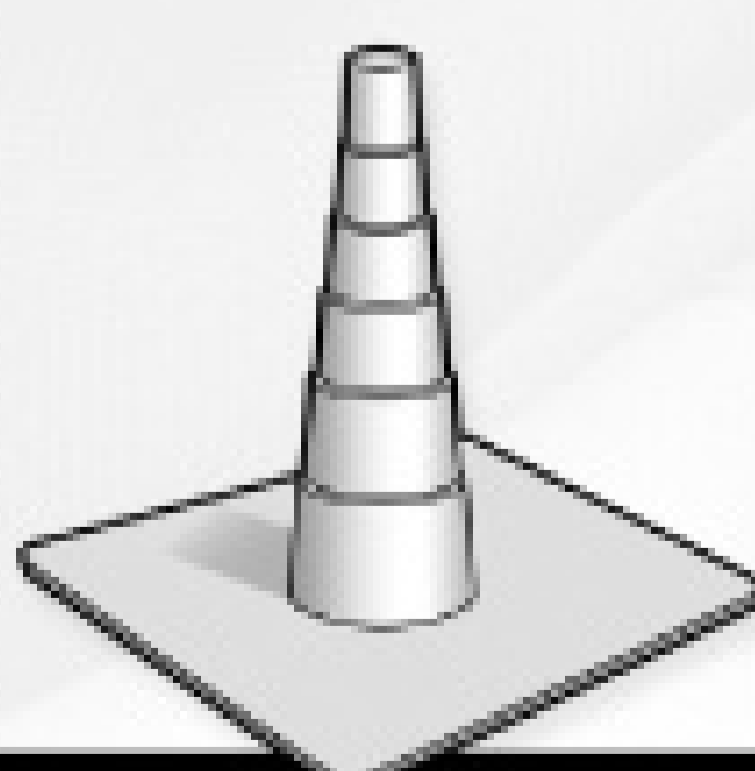
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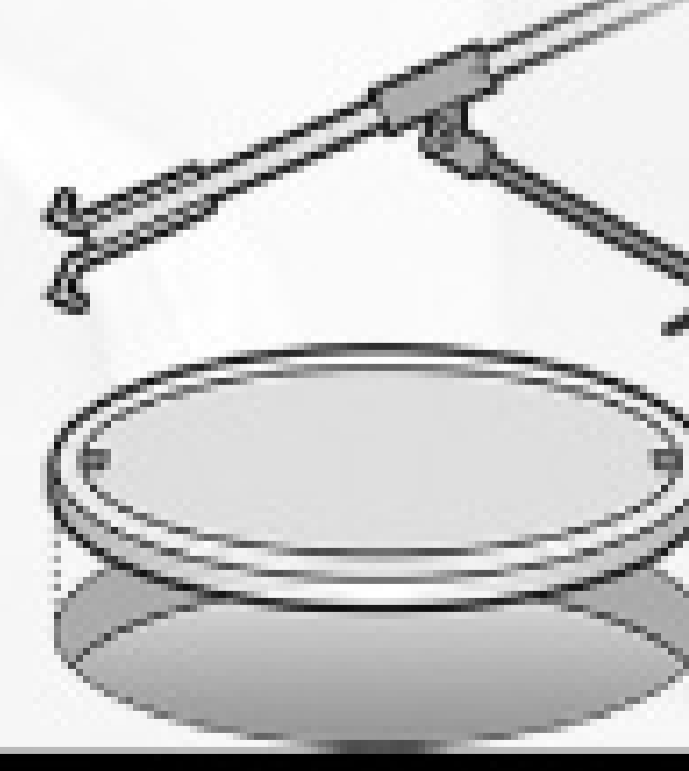
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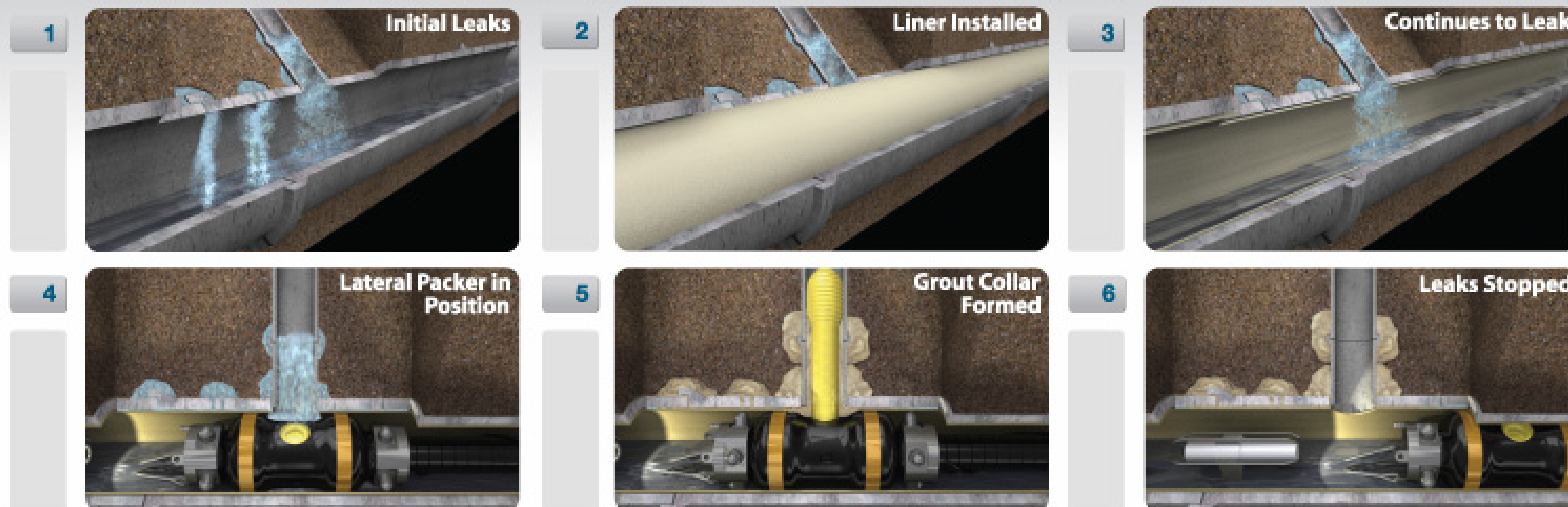


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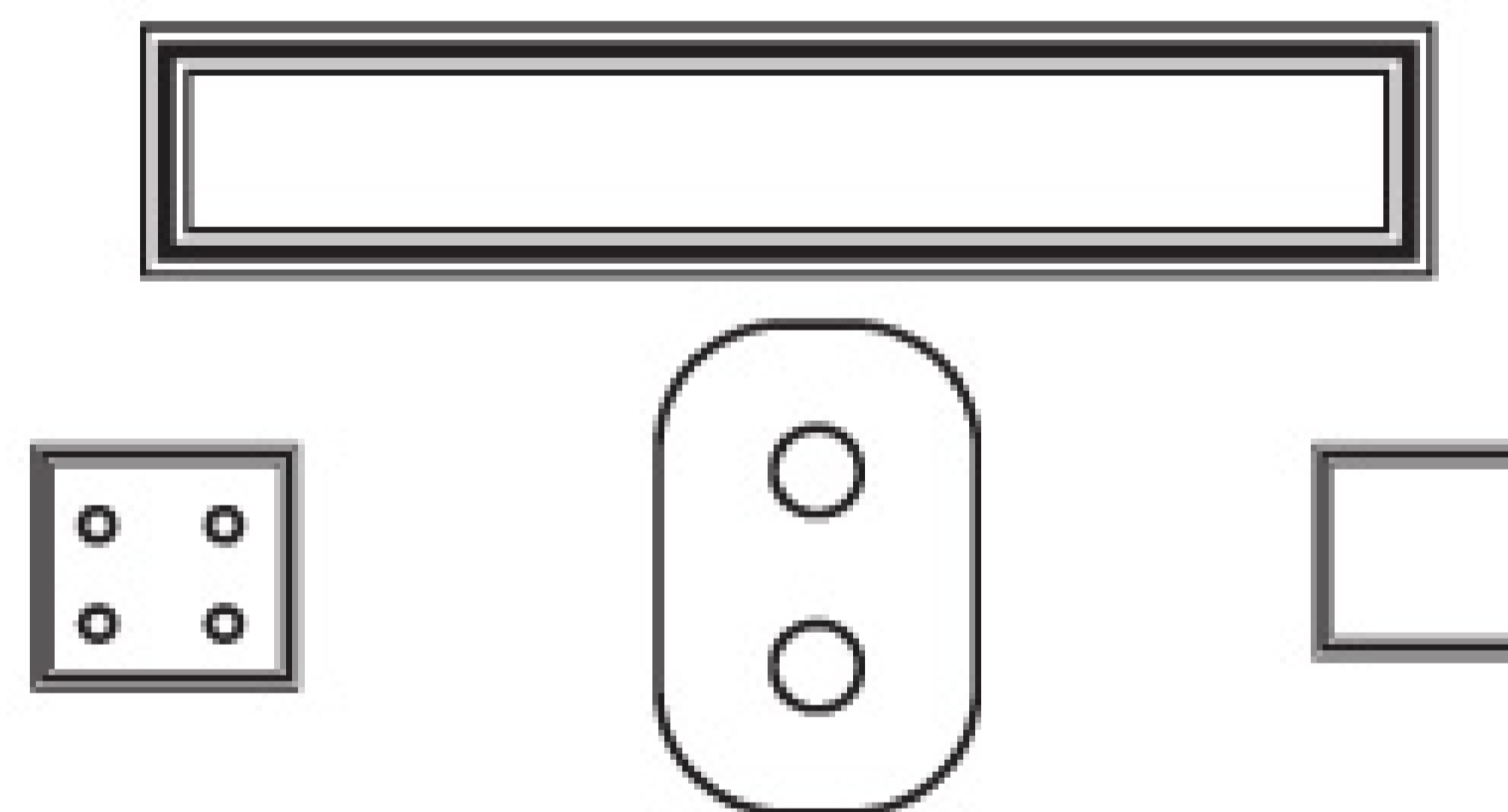
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MERIT RAISES PAY DIVIDENDS

A water utility in metropolitan Portland, Ore., finds that a switch to a merit pay system produces high-performance employees

By Ken Wysocky

Salaries used to give employees plenty to talk about around the water coolers at the Tualatin Valley Water District in metropolitan Portland, Ore.

"We used to get complaints all the time," says Debbie Erickson, human resource manager. "Managers set pay raises at their own discretion. All our salaries are public record, and people tend to talk."

Adds general manager Greg DiLoreto: "We're not unionized, so there were no formal pay grades. With fewer than 50 employees, it was almost like a family business. Raises were handed out at the whim of a manager. When employees saw a co-worker got a bigger raise and they didn't understand why, it created a lot of frustration. There was a lack of fairness and consistency, which were legitimate concerns."

Today, things are much different at the utility, which serves about 200,000 customers in parts of three western and southwestern Portland suburbs. More than a decade ago, the utility's board implemented a merit pay system and made a commitment to become the region's employer of choice by paying higher-than-average salaries.

As a result, the utility's turnover rate is 1 percent (not counting retirements), and attracting new employees is rarely a problem, DiLoreto and Erickson say.

Starting from scratch

To revamp its pay system, the utility hired a consultant to help it evaluate every position and assign it a specific grade based on criteria such as job responsibilities, educational requirements, decision-making authority, and experience.

In addition, the utility developed exacting performance standards for each position. "We set the bar pretty high," Erickson says. "They're held to a pretty high standard."

DiLoreto notes, "Each employee knows exactly what's expected of them. They're reviewed based on how they measure up to those expectations, and their raises reflect that. An 'A' student gets an 'A' raise — you don't just come to work and get a raise. The harder and smarter you work, the more money you make."

The performance reviews, based on hire-date anniversaries, are very precise. Each employee receives a detailed score based on his or her evaluation, and every employee's score earns a slightly different raise, even if the scores are only decimal points apart. "That way, even the smallest effort gets rewarded," Erickson says. "Our spreadsheet for evaluation scores is a mile long."

Salaries make the grade

The last component of the new system involved putting together salary ranges for each grade. The

ranges are adjusted annually, based on the Consumer Price Index (CPI) for western cities. As such, it should take an employee the better part of a career to reach the top of his or her salary range, DiLoreto says.

Employees who meet job expectations receive a merit raise that's at least equivalent to the CPI. If their review results in a raise greater than the CPI, then they

"[Employees] know their entire careers here are based on being rewarded. They're attracted to a system that rewards them fairly for their efforts. There's no incentive to work harder when you just get what you get."

Greg DiLoreto

move up in their range. As such, even employees who are in the same job classification can earn different salaries within their range.

In rare cases where employees reach the top of their salary range and get rave reviews, they still receive raises via the CPI adjustment. In addition, they receive the merit portion of their raise as a lump sum.

Consider a top-performing employee who is at the top of a salary range and is slated to receive a 6 percent raise. If the range moved 3 percent because of the CPI, the employee would receive a 3 percent pay bump and a 3 percent lump sum.

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.

"That way, employees don't get penalized for doing a good job," DiLoreto says. "It truly rewards employees for their good work and provides an incentive to do good work, unlike many typical public-sector pay plans."

On the other end of the spectrum, employees who receive a poor job review may not even receive a cost-of-living salary increase, Erickson says.

Beating the average

To compete effectively for the best employees, the district set its pay ranges 2 percent higher than the regional average. "We base the ranges on regional salary scales for utilities in Washington and Oregon of comparable size and nature," DiLoreto says. "We throw out any salary range that's more than 10 percent above the others on average. We also review those ranges every five to eight years to ensure we remain competitive. Our employees do quite well. The average raise in 2008 was 6 percent."

How does the district afford those raises at a time when many

utilities are scrambling for revenue? It helps that the utility is entirely self-supported by rates and charges. "It's not like a water utility that's owned by a city, which can siphon off [utility revenue] to pay for whatever city officials want," DiLoreto says.

He also notes that the merit portion of salary increases is restrained by the district's budget. Moreover, the district doesn't need to impose exorbitant rates to offer employees competitive pay. "Our rates are pretty much in the middle of the metro Portland area," he says. "It also helps that we're enjoying a fairly robust growth rate."

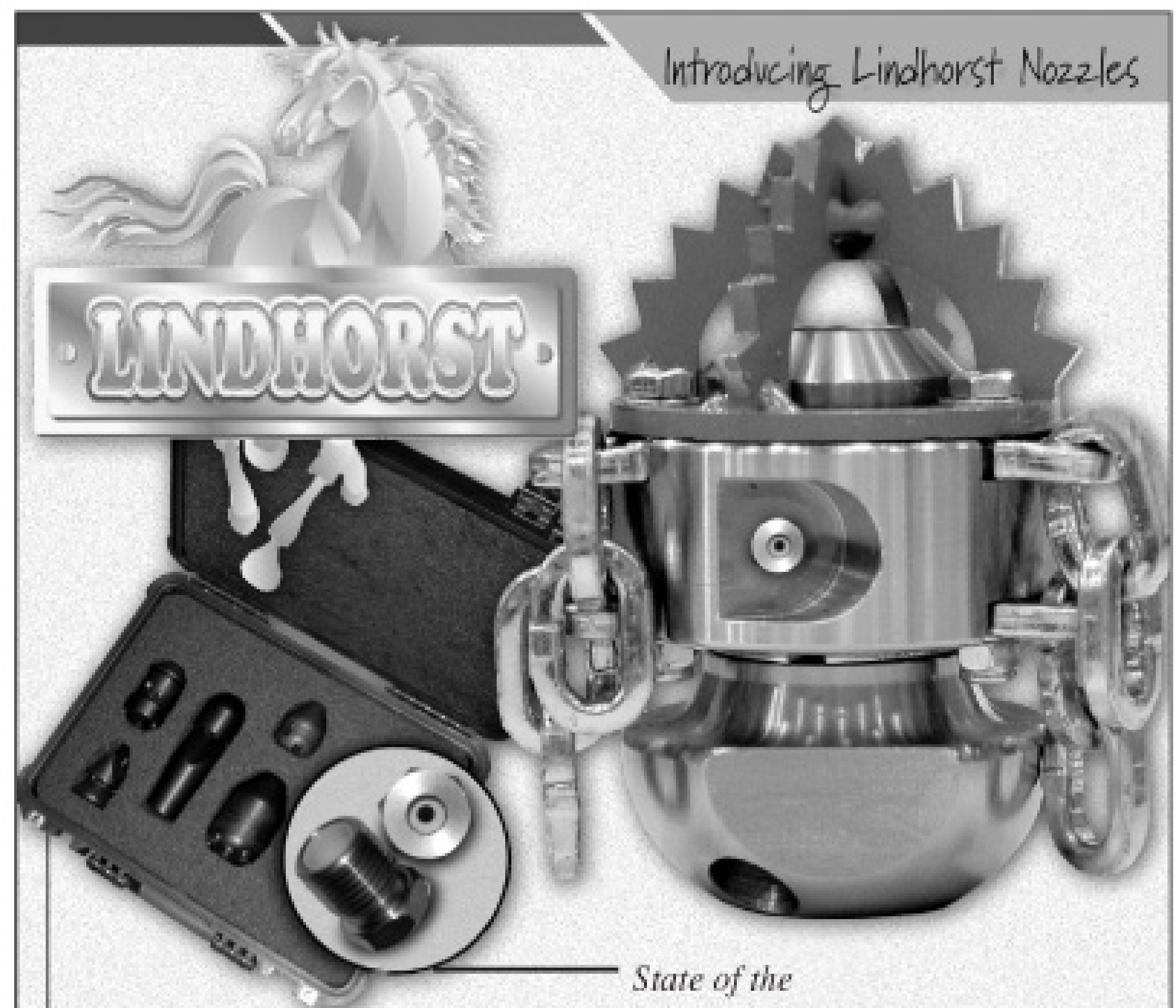
Delivering results

Overall, employees are much happier with the merit pay system. A good indicator is the district's

rate of employee turnover, which is negligible. "They know their entire careers here are based on being rewarded," DiLoreto notes. "They're attracted to a system that rewards them fairly for their efforts. There's no incentive to work harder when you just get what you get."

Erickson also points out that the district typically finds it easy to fill open positions. "We recently had an opening for a meter reader and received 100 applications," she points out. "Some of that may be due to the economy. But that notwithstanding, we rarely have a problem getting enough qualified applicants."

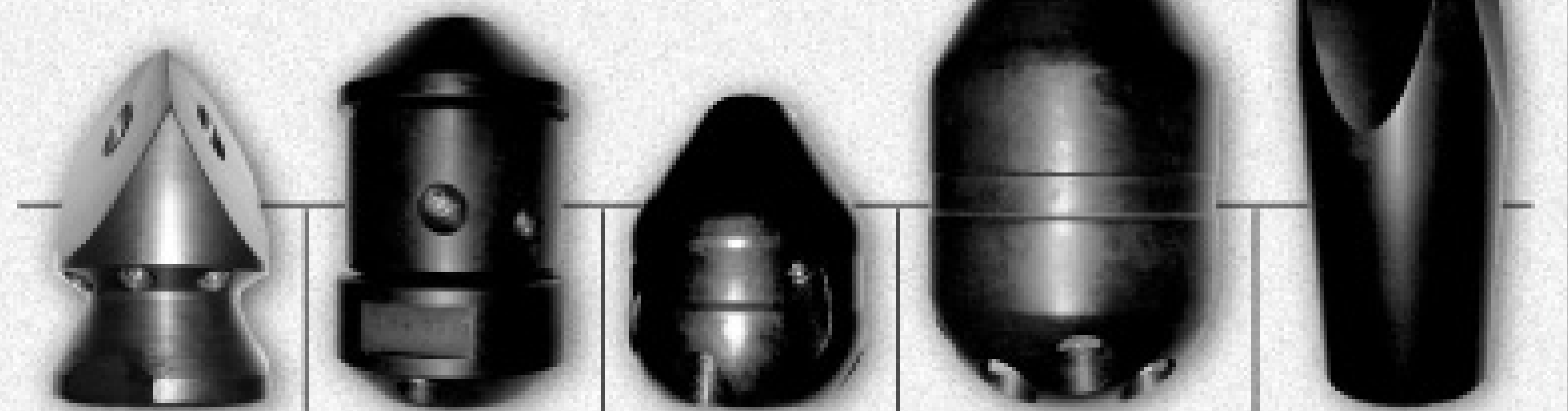
And there's a lot less complaining about salaries at the water cooler, too. ♦



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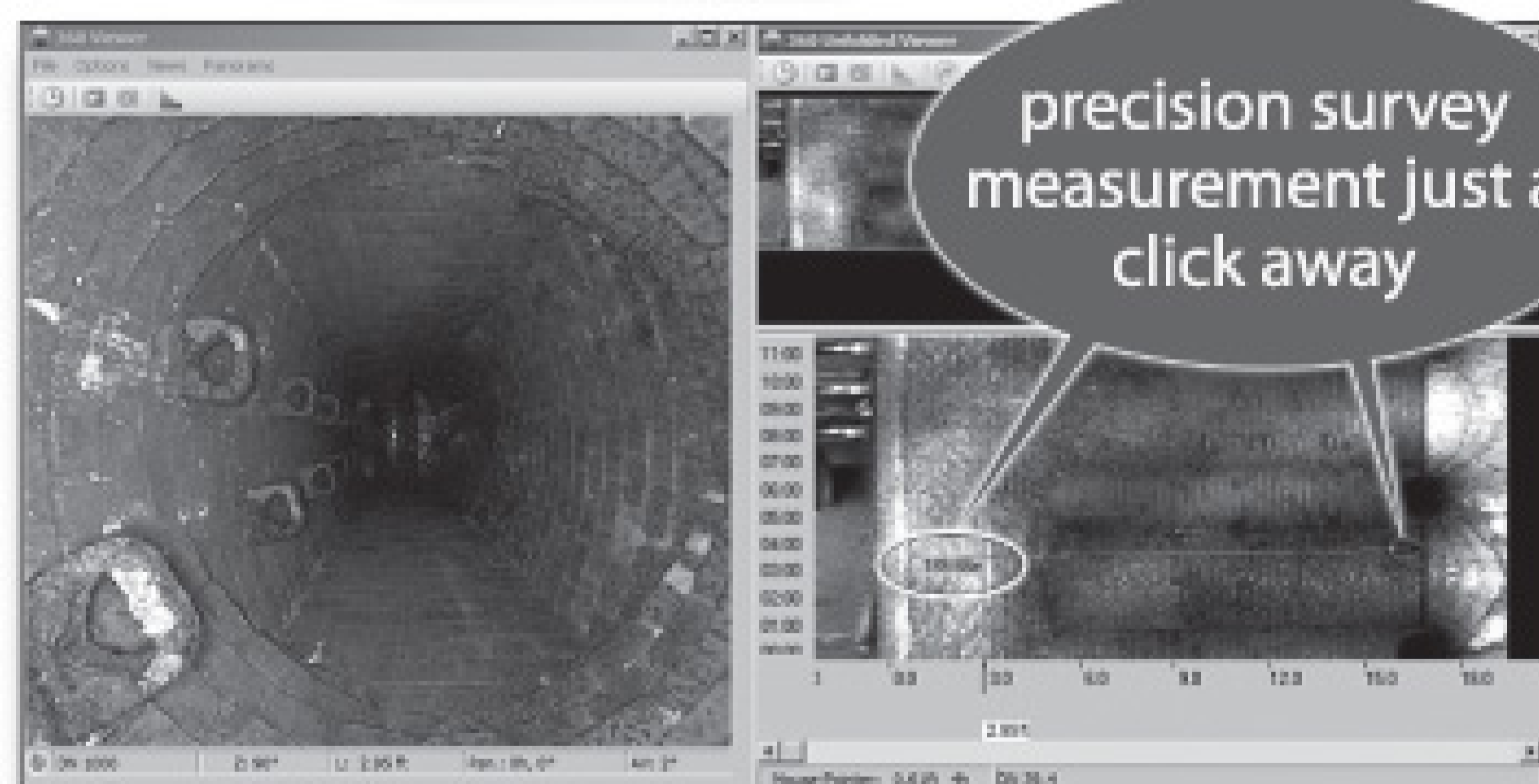
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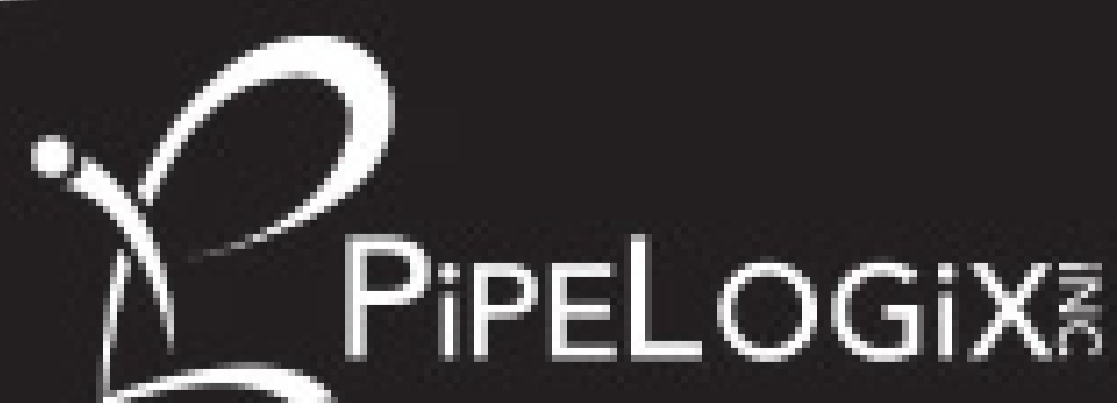
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NASSCO Introduces Sewer Grouting Web Site

The National Association of Sewer Service Companies has launched www.sewergrouting.com, a Web site for the group's Infiltration Control and Grouting Association. The site features stories from the field, specifications, schedules for upcoming training and more.

Pipe Eye International Adds Mobile Inspection Center

Pipe Eye International has acquired a 20-foot trailer that will serve as a portable base of operation for its North American inspection team. The trailer can be pulled by a 1-ton 4x4 diesel pickup and be on-site within days. The trailer eliminates the need to fly crews and ship equipment to project sites.

Perma-Liner Receives Keeping America Strong Award

Perma-Liner Industries Inc. was presented the Keeping America Strong Award by Rear Adm. Kevin Delany (Ret.) on the *Heartbeat of America* program. The televised program focuses on small, American-based companies that promote economic growth within their respective industry.

Spartan Tool Names Nesky VP of Sales

Keith Nesky has been named vice president of sales, North America, by Spartan Tool LLC. He will be responsible for broadening product coverage among sewer and drain-cleaning professionals.

Flexible Pipe Tool Acquires Shamrock

Flexible Pipe Tool LLC has acquired Shamrock Pipe Tools Inc. Michael O'Leary, Shamrock general manager, has been promoted to president of Shamrock Pipe Tools. The company will continue to operate independently out of its Baton Rouge, La., location. All staff, existing dealers and representatives will remain unchanged.

CWR Report Reveals Industry's Economic Impact

A \$1 billion investment in water and wastewater infrastructure could result in a total national output (demand for products and services in all industries) of between \$2.87 billion and \$3.46 billion, according to a report by the Clean Water Council and chaired by the National Utilities Contractor Association. The report also says such investment could create up to 26,669 new jobs (with average annual earnings for the construction portion of the jobs at \$50,396), generate personal household income of between \$1.01 billion and \$1.06 billion and generate approximately \$82.4 million in state and local tax revenue.

REHAU, DBI to Produce Municipal PVC Pipe

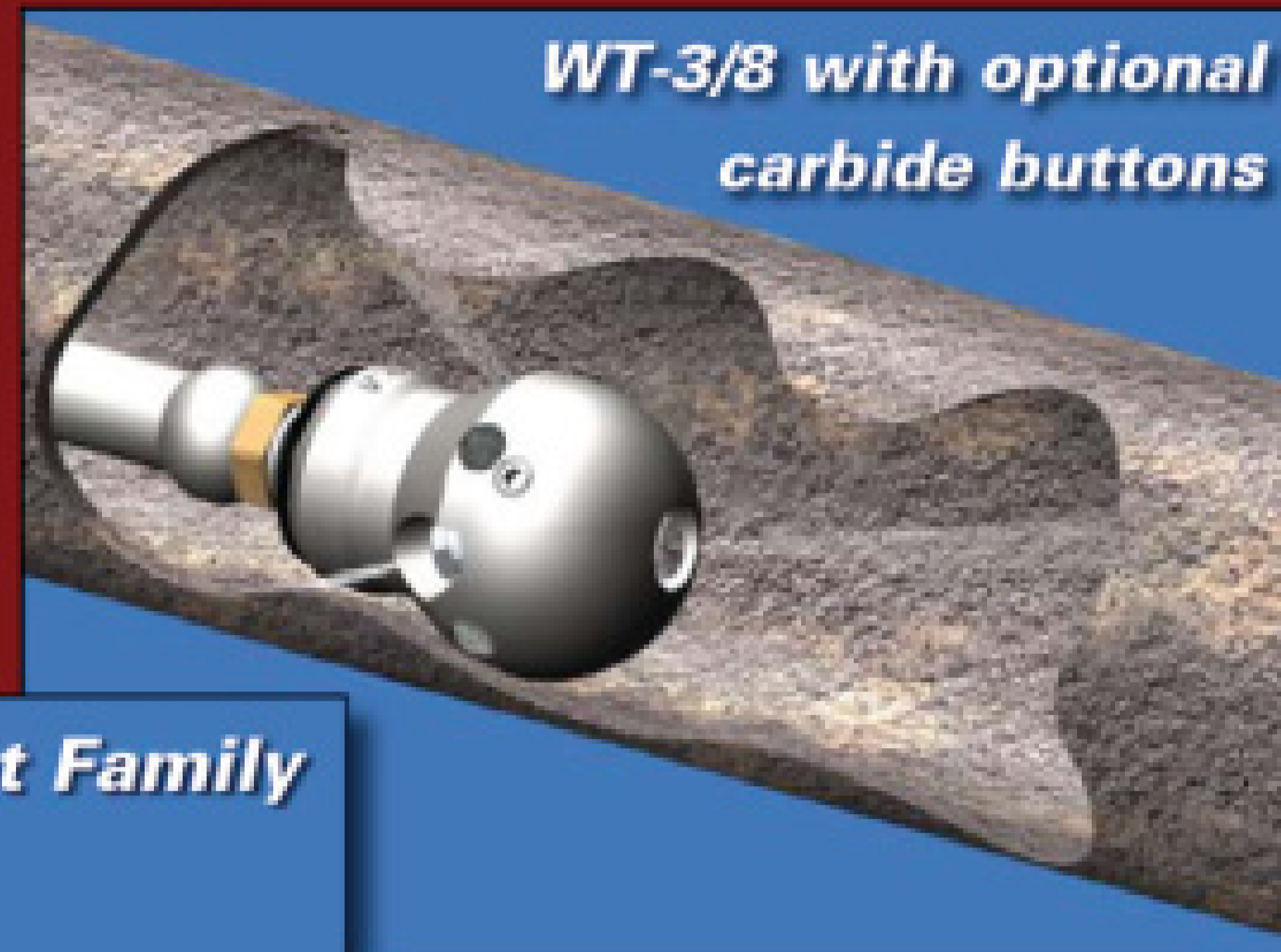
REHAU Inc. of Leesburg, Va., and DBI of Quebec City have partnered to produce and distribute municipal PVC pressure, sewer and storm drain pipe. The agreement will enable REHAU to reopen its Prescott, Ontario, plant, which closed in November 2008. ♦

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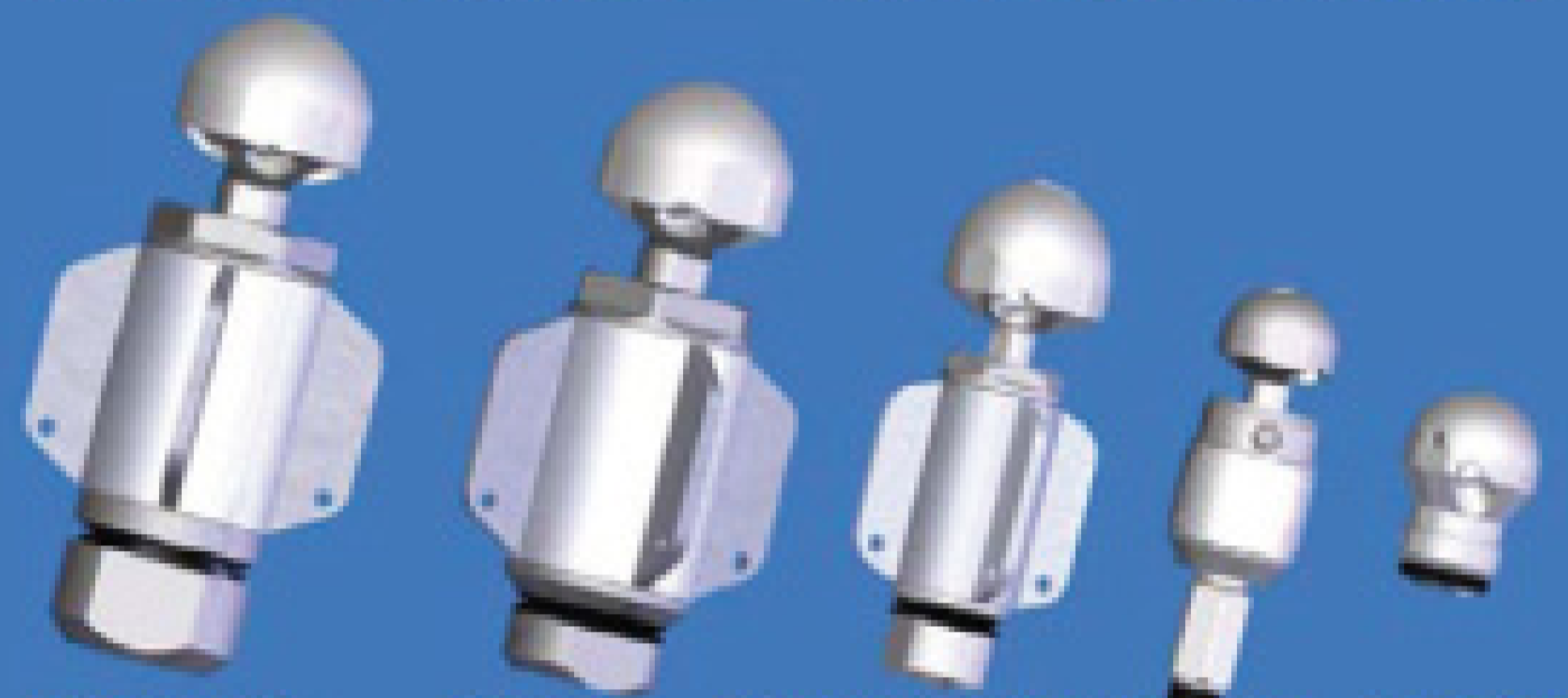


WT-3/8 with optional carbide buttons

WT-3/8 Warthog™ now available with carbide buttons

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HAVING FAITH IN OUR RECESSION-PROOF INDUSTRY

By Irvin Gemora

I picked up *The Washington Post* just a few days after President Barack Obama was sworn in as our 44th president, and there, in black-and-white text on the front page, I saw the words “water and sewer” under a big bold heading — Infrastructure. Wow!

I’ve been in the sewer industry for decades, and I so often wondered when our industry would make headlines. I’m thrilled that the day has finally come. Lawmakers are finally realizing that we’re not effectively caring for our nation’s most vital public resource. Our industry is now at least getting some attention it deserves, and desperately needs. While time will tell exactly how

much will be invested, we’re off to a good start.

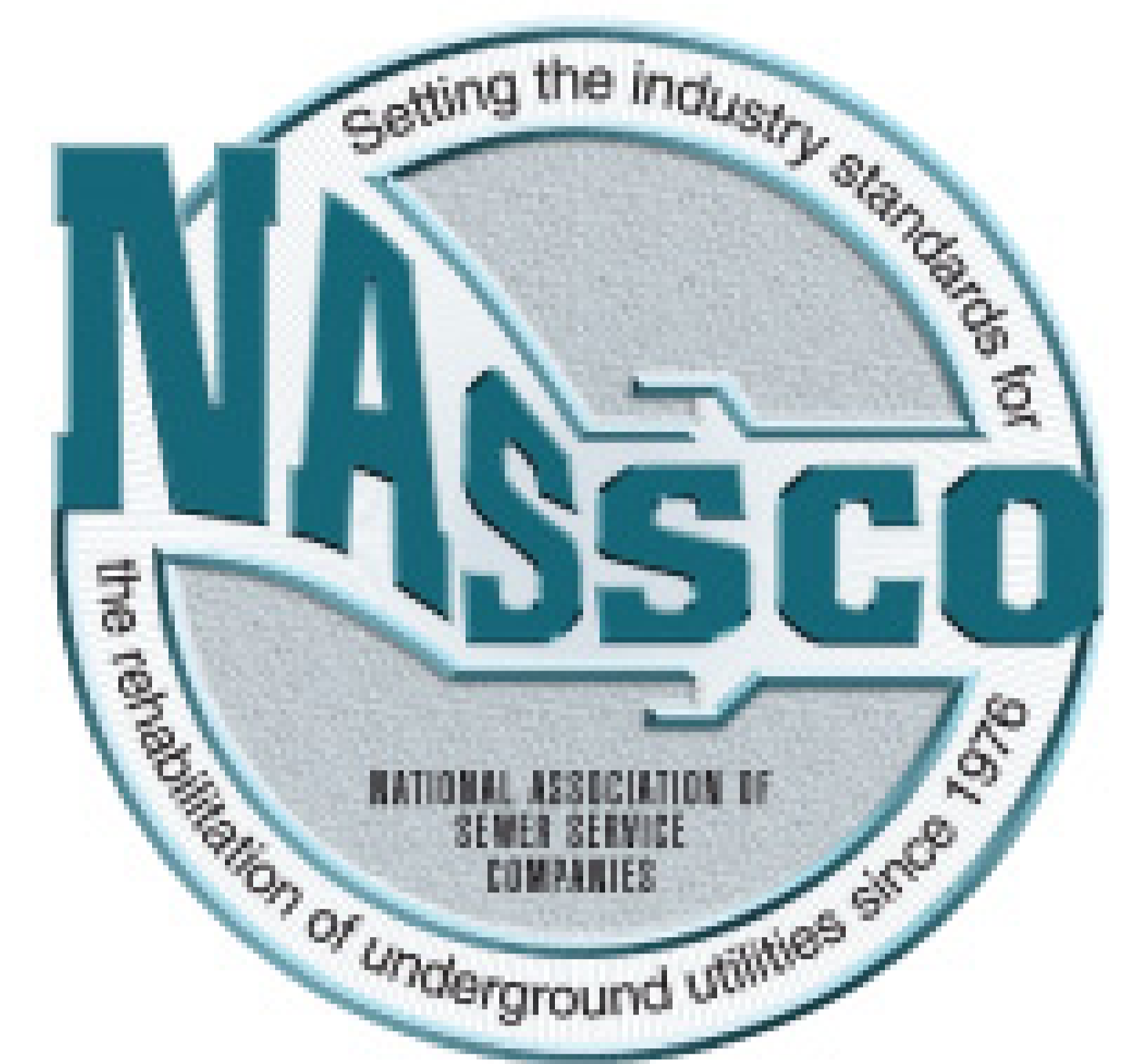
Surrounding this headline were many other headlines on our suffering economy. Company layoffs, hunger rate increases and ways to spend less were a few other topics in the same issue. These powerful articles on today’s tough economy affect us all — what we buy, how we run our businesses and how we live our lives.

We in the trenchless technology industry are lucky. In fact, I would even go so far to say that we’re recession-proof. We have the EPA issuing consent decrees that guarantee work in densely populated cities throughout the country. We have thousands of shovel-ready projects waiting to start. We have a new president who promises to

invest in our industry. And, we have increased public awareness of our issues.

And we’ve really only just begun. Our industry is relatively young and has much room for growth. Remembering that will help not only you and your business, but the entire trenchless technology industry.

I must admit I’m not happy when I pick up the paper and hear about a water main break or worse — when I’m stuck in traffic while one is being fixed — but a part of me knows that these problems are just what it will take to get the public’s attention. Since we’ve long been using our nation’s sewer system without properly maintaining and investing in repairs, the public will continue to experience these



types of incidents as we slowly work to repair our pipelines.

And with every headline our industry gets, we’re just one step closer to making the out-of-sight industry top of mind for the public. Look beyond the negative headlines and see the opportunity for you, your business and your industry. ♦

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

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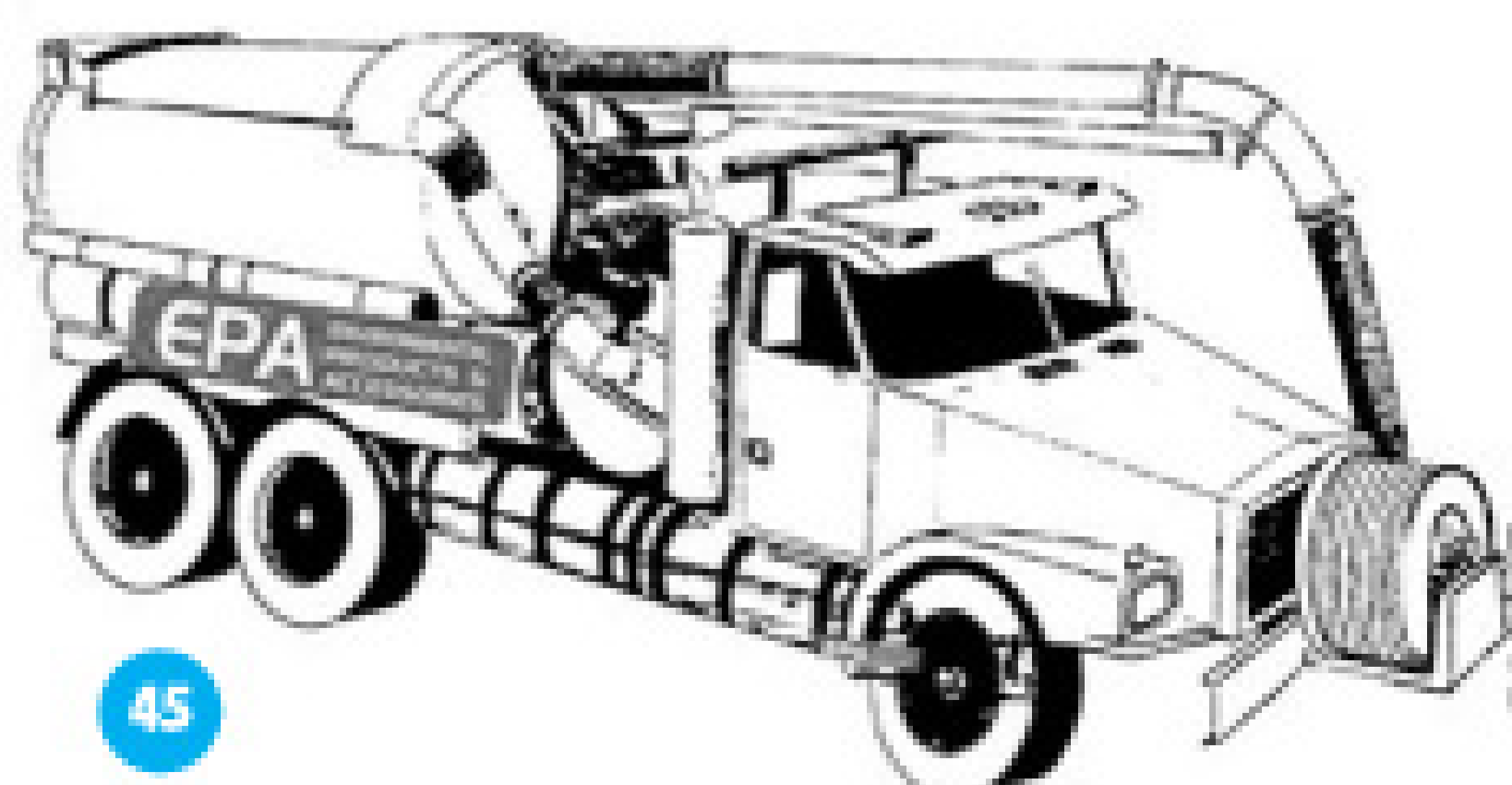
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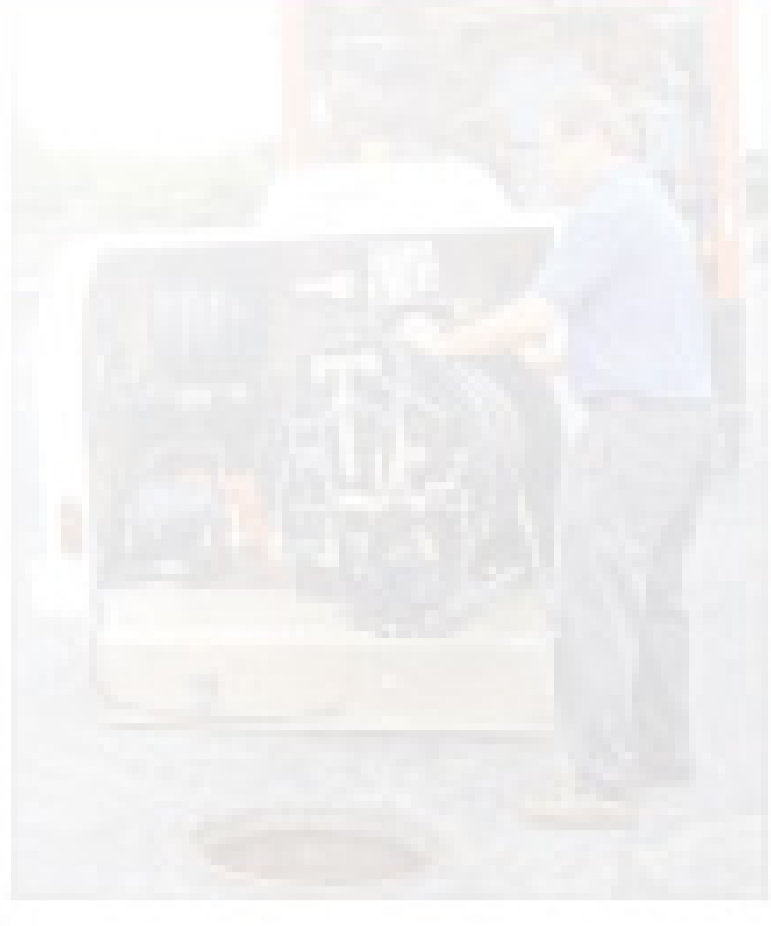


The Warrior jetter from Spartan Jet LLC allows for faster trenching and jetting.

Jetting and trenching
The Warrior jetter from Spartan Jet LLC allows for faster trenching and jetting.



Workers in various settings, including one with a 'MUNICIPAL SEWER WATER' sign and another with 'OUT OF SEWER ALWAYS IN M'.



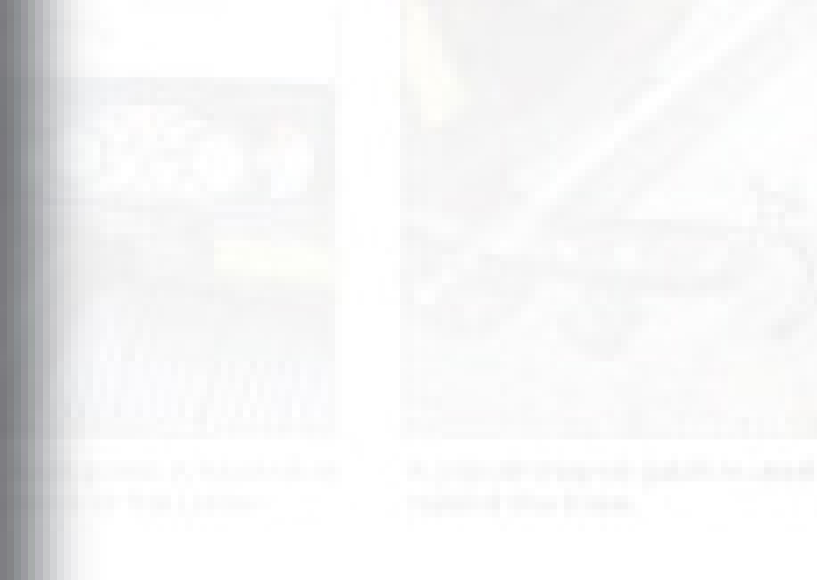
Worker Tim Johnson is shown operating the Warrior jetter. The jetter's sound-attenuated shell and muffler enable the Warrior to jettison tool to reduce operating noise.



Worker Tim Johnson is shown operating the Warrior jetter. The jetter's sound-attenuated shell and muffler enable the Warrior to jettison tool to reduce operating noise.

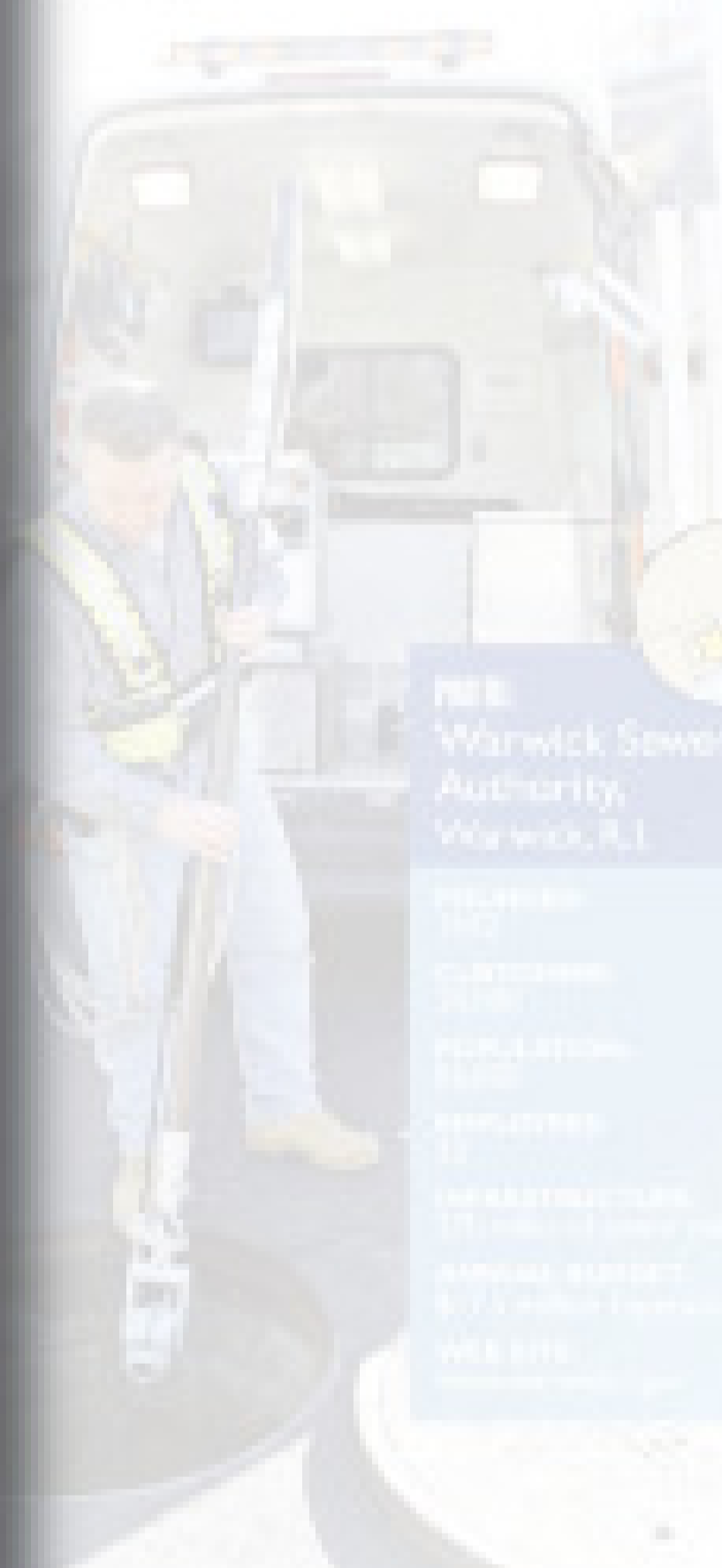
...the jetter's sound-attenuated shell and muffler enable the Warrior to jettison tool to reduce operating noise.

...the jetter's sound-attenuated shell and muffler enable the Warrior to jettison tool to reduce operating noise.



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