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FOR SANITARY, STORM AND WATER SYSTEM MAINTENANCE PROFESSIONALS
October 2010
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COMPLIANCE THROUGH INNOVATION

The right equipment and sharp people keep Clean Water Services in step with regulations

PAGE 14

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INSIDE:

CLEANING AND MAINTENANCE STRATEGIES

COVER:
Clean Water Services in Washington County, Ore., is challenged by discharging effluent to the county's only river, which is also the local source of drinking water. Innovation-minded employees and well-chosen equipment help the agency succeed. Here, crew lead Adam Werner works at the newly updated control panel of an Aquatech B-10 combination truck from Hi-Vac Corp. (Photography by Bryan Welsh)

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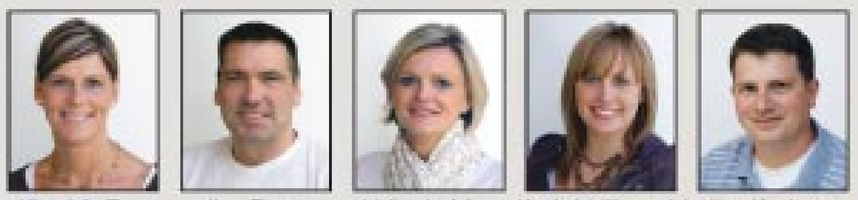

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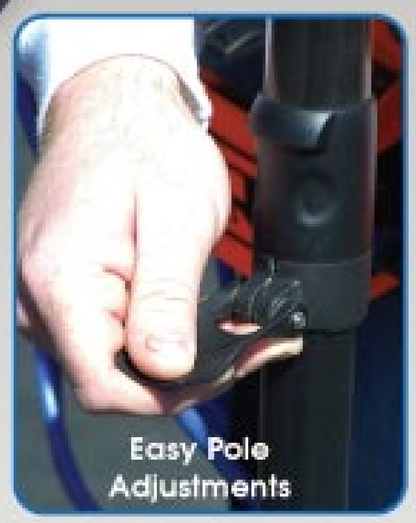
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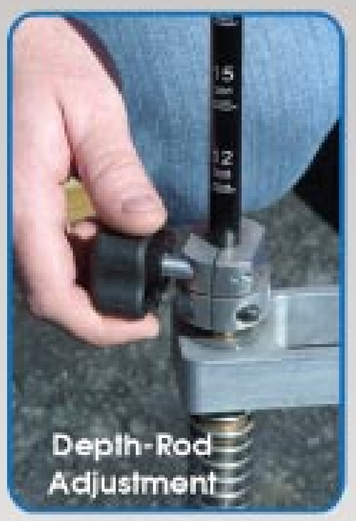
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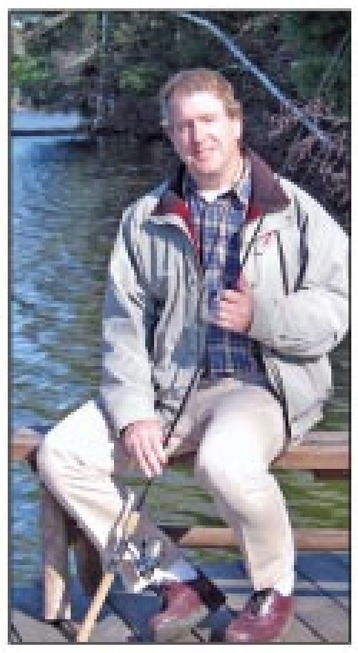
GETTING SERIOUS

Water loss is gaining ever more attention as a serious problem. What innovative steps are you taking to detect and stop leaks?



FROM THE EDITOR

Ted J. Rulseh

While in college I sometimes worked in the cafeteria dish room, scraping plates and running food scraps down the garbage disposal. One day an exchange student from Africa saw half-finished hamburgers, bowls mostly full of vegetables, entire cookies, and all manner of other items headed for those iron jaws.

Staring in disbelief, he observed, "People in my country would kill for this food."

Now imagine a visitor from a water-starved country (and there are many of those) observing how much drinking water some of our communities waste. Might his or her reaction be much the same?

On the radar

Most water utilities have been concerned for years about water losses — it's a matter of economics. But as water scarcity begins to hit home, even in parts of generally water-rich countries like the United States, the concern is growing.

Of course, in an important way, wasting water is not the same as wasting natural gas or oil, or dumping valuable metals into a landfill. Water that's wasted isn't gone — it goes back into the earth, or into the air through evaporation, by way of the miracle of the water cycle. So when drinking water is lost through leakage or profligate use, what we really lose is the energy and money needed to treat, pump and distribute it.

But that's not to excuse waste — which according to various studies is rampant all over the world. The American Water Works Association, in its 2007 State of the Industry Report, estimated losses at 10 to 20 percent in water distribution systems throughout the United States.

In a report on reducing non-revenue water, the World Bank estimated that 32 billion cubic meters of treated water — that's 8.4 trillion gallons — leaks from water distribution networks each year, half of it in developed countries.

The report estimated the cost of leaks, in reduced revenues and increased operational costs, at more than $14 billion a year. The report also said a 50 percent reduction in non-revenue water would save enough to provide eight billion cubic meters — 2.2 trillion gallons — to serve customers and supply water to 90 million more people.

(I know, it's not that simple: to supply those additional people, there would have to be a way to get the water to them. But the point remains.)

Experts convene

The problem is serious, and the world is taking notice. In June, 400 leading global water professionals gathered in Sao Paulo, Brazil, for the International Water Association (IWA) Water Loss 2010 conference. At that meeting, the association established an IWA Specialist Group.

Tim Waldron of Wide Bay Water, Australia, interim chairman of the group, stated, "In order to reduce water losses and future water demand, the specialist group will continue to develop strategies to manage water loss and make the results of its work available to stakeholders, including water industry governance groups, utilities and employees, associated individuals and companies, and community representatives at all levels of government, including national and international agencies."

Water Loss 2010 was the sixth in a series of speciality conferences organized by the IWA Water Loss Task Force. Another global IWA meeting on Water Loss was to be held Sept. 19-24 at the IWA World Water Congress and Exhibition in Montreal, Quebec.

In a report on reducing non-revenue water, the World Bank estimated that 32 billion cubic meters of treated water — that's 8.4 trillion gallons — leaks from water distribution networks each year, half of it in developed countries.

Acting locally

That's what is happening globally. What is happening locally — in your community? *Municipal Sewer & Water* reports regularly on community and utility managers doing exemplary work to maintain and rehabilitate underground infrastructure.

We're especially interested in innovative methods — whether that means new technologies, better applications of old ones, or initiatives to enhance staff performance or enlist the public behind infrastructure programs.

For right now, let's talk about drinking water. What is your community or utility doing — in innovative ways — to find and fix water leaks and otherwise reduce water waste and water losses?

Send a note to editor@mswmag.com and briefly tell us your story. I promise to respond, and we will report on some of the most exciting initiatives in future issues. ✦

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COMPLIANCE THROUGH INNOVATION

Clean Water Services keeps in step with strict regulations by allocating the right equipment to the job and encouraging team members to contribute ideas

By Peter Kenter

It's a challenge servicing sanitary and storm sewer systems in a county comprising 616 square miles with a population of half a million.

That's especially true in a Pacific Northwest state with strict environmental regulations, and when wastewater effluent discharges to the county's only river, which is also the major local supply of drinking water.

Clean Water Services tackles that challenge in Washington County, Ore. CWS is a water resource management utility established in 1970 to consolidate the water and wastewater services of a dozen communities. It has diverse responsibilities that in addition to wastewater and stormwater include flood management, water quality and stream enhancement projects, street sweeping, and fish habitat protection.

Strict attention to environmental regulations is paramount, but CWS finds that superior results are best achieved by giving team members the latitude to adopt innovative policies and to select the technology that best suits the job.

Dane Smith, purchasing and fleet coordinator, and Ted Claussen, maintenance supervisor, have logged 32 years apiece with CWS. "Dane started in April, and I started in June," jokes Claussen. "He'll go before I do."

They describe the CWS service area

PROFILE:
Clean Water Services, Washington County, Ore.

FOUNDED:
1970

POPULATION SERVED:
500,000

AREA SERVED:
616 square miles

EMPLOYEES:
300

INFRASTRUCTURE:
800 miles of sanitary sewer lines, 470 miles of stormwater lines

ANNUAL BUDGET:
$48 million (operations)

WEB SITE:
www.cleanwaterservices.org

Crew lead Adam Werner and field construction maintenance technician II Pat Romane clean one of Clean Water Services' nearly 14,000 catch basins, which are serviced every year. (Photography by Bryan Welsh)

Members of the Clean Water Services maintenance team include, from left, purchasing and fleet coordinator Dane Smith, maintenance supervisor Ted Claussen, field construction maintenance technician II Jim Stahly, crew lead Bob Sorenson, field construction maintenance technician II Pat Romane (on step), and crew lead Adam Werner (in truck).

General Equipment Company built a lazy Susan holder for sections of vacuum tube on Clean Water Services' Aquatech combination trucks.

as a puzzle. The utility must carefully allocate resources to each community — the largest is Hillsboro — and ensure that no activity in one community adversely affects the outcome in another. At the end of the day, success is measured by the health of the Tualatin River, a tributary of the Willamette River, where wastewater treatment plant effluent is released.

Strict regulations

Keeping the county's sewer and stormwater system clean and televised is a CWS priority. At the county's disposal is a fleet of combination trucks, waterjetters and TV inspection vans.

The backbone of the maintenance fleet is a team of six Aquatech B-10 combination trucks and an Aquatech SJ1500 jetter, all from Hi-Vac Corp. Crews can also deploy two Model 800-H truck jetters from Sewer Equipment Co. of America.

Smith likes the versatility of the Aquatech units to service both sanitary and stormwater lines. "For our purposes and our budget, they give us the broadest service," he says. "Our crews like the B-10 in particular because it has the hose reels on the rear bumper, which lets the operator maintain an upright position. They say it's better for their backs and more ergonomically friendly."

The department operates five TV vans, four from Aries Industries and one from Rausch Electronics USA.

The county has more than 800 miles of sanitary sewer lines and 39 lift stations feeding four treatment plants. The pipes are concrete except for about 5 percent PVC. It's a relatively new system: roughly two-thirds has been installed since 1975.

"Most of the sanitary lines are in good shape, with tight joints," says Claussen. "We try and clean the sanitary system once every three years. I prefer to keep it closer to 24 months, and we've been meeting that goal significantly during the past four years."

Basin by basin

The system is divided into basins and sub-basins. The sanitary sewer system comprises three basins and 115 sub-basins. The lines are also regularly hydroflushed with the Aquatech units, and the entire system is inspected every seven to eight years. In-house crews carry out much of the repair work.

"They're capable of virtually every kind of repair," says Claussen. "A lot of it is old school dig-and-replace, because we don't get a lot of freezing weather here — maybe two weeks out of the year." The county also owns pipe burst-

RECYCLING RIDES

Clean Water Services is committed to environmentally sound principles that include reuse and recycling. That extends even to the equipment fleet.

"We had a 1996 Aquatech SJ1500 jetter truck on a Freightliner chassis that we thought we'd like to keep around a little while longer," says Dane Smith, purchasing and fleet coordinator. Crews often preferred the older model because its rear hatch covering the hose reel provided a shelter in rainy weather and its low profile made it easy to maneuver on county roads.

"In keeping with our recycling goals, we investigated refurbishing it instead of buying a new one," says Smith. CWS budgeting rules gave Smith the freedom to allocate the cost of refurbishing the unit under the capital budget. The cost also fell below the threshold where a request for a proposal was required, making the process simpler than a new purchase.

"We sent the unit to the Hi-Vac dealer in Portland to be completely refitted and refurbished, from pumps to tank, and then had them put it back on the old chassis," says Smith. "When it came back it was like a brand-new vehicle. The truck only has 100,000 miles on it, so we think we can get another 10 to 12 years out of it."

Smith reckons the department saved about $70,000, and he was so pleased with the results that he's sending out a 1999 MT45 Freightliner TV inspection van to TEC Equipment of Portland for a makeover. Expected savings: $40,000 to $50,000.

"TV vans are ideal candidates for refurbishing because they've got such low mileage on them," says Smith. "Driving at low speeds from manhole to manhole, this one has a heavy-duty chassis and only 45,000 miles on it. When we have it mechanically checked over and steam-cleaned, then put the cameras back in, we expect to get another dozen years out of it."

Crew lead Bob Sorenson operates the easement machine built by KWMI Manufacturing. It allows crews to reach off-road manholes up to 800 feet from the truck, making it much easier to clean remote sewer lines.

Crew lead Bob Sorenson and field construction maintenance technician II Jim Stahly prepare for a pipe cleaning job.

ing units from Vermeer Corp. and TRIC Tools and a chemical grouting truck from Aries Industries. Outside contractors handle cured-in-place pipe lining for larger pipes 36 inches and up.

Stormwater management is critical because mountains surround the communities. "The water goes where it goes," says Claussen. Heavy rains can cause flash flooding, but combined sewers are a distant memory. A series of smaller surge basins help collect excess rainfall, although occasional floods clog storm drains, necessitating midnight flush-and-vacuum operations.

"Heavy rains always seem to hit between midnight and two in the morning, when it's hard to find the drains in the dark," notes Claussen. The stormwater system comprises about 470 miles of lines, including trunks and interceptors. The agency also maintains 13,500 catch basins, and 600 water quality manholes.

Like the sanitary system, the stormwater system is divided into basins and sub-basins. The stormwater system consists of four main basins and 65 sub-basins.

No flushing

Only the Aquatech units are used for stormwater system maintenance, and only to clean and vacuum the system; jetting would raise sediment and flush it through the system instead of removing it.

"Our goal is to clean out 25 percent of the storm lines annually as a minimum goal, but we generally exceed that," says Claussen. "We clean all of the catch basins annually and all of the water quality manholes twice a year."

Checking the water quality manholes is crucial, because they contain a baffle system that traps floatables, oil, grease and silt. The lines are generally televised after cleaning. "We like to get a nice clean shot of the lines as we leave them," says Claussen.

CWS has taken on the duty of street sweeping because it directly affects the quality of stormwater. "In 1990, the surface water management program identified the amount of phosphates, oil and sediment coming in off the streets, so we adopted an aggressive street sweeping program," says Claussen.

The sweepers use a regenerative air system, not mechanical brooms, to lift dirt from the streets. They're limited to traveling at five miles per hour, and their progress is constantly monitored to ensure that the roads are clean.

"The sweepers may soon be outfitted with GPS to monitor their exact coverage, speed and hours of service," says Claussen. "Our thinking is that the cheapest way to eliminate impurities is to sweep them up before they get into the system. We figure it costs four times as much to pull the dirt out of the catch basins than to sweep it up."

Claussen notes that once impurities descend below road level, the cost of dumping increases from next to nothing to almost $80 a ton, because the debris is then classified as hazardous waste.

Industries on board

Customers are educated about containing contaminants before they enter the system. Industrial clients are monitored and are required to report any contamination accidentally introduced into the system.

"We have on-site labs that go to the client to do sampling of the contaminants," says Smith. "We can't just wait at the treatment plant to identify what's coming down the pipe." Restaurants participate in a fats, oils and grease (FOG) program. Bacterial treatment of food grease at the retail level is discouraged because it can interfere with microbes in the wastewater treatment process.

Roots are a problem in both the sanitary and stormwater systems. The guilty parties here are primarily corkscrew willows and silver leaf maples. For pipes up to 12 inches, crews use hydraulic cutters to pulverize roots. "Anything above that, there's too much pressure loss," says Claussen. "We use chain cutters in the bigger lines."

The department uses root foaming treatments in the sanitary sewer system, but such chemicals are not allowed in the stormwater system.

"Our crews are pretty creative and we listen to their suggestions. We're also given enough freedom within the rules to choose the best equipment for the job."

Dane Smith

Innovative equipment

Innovation is part of the CWS culture. Crews are allowed to select specialized equipment to suit their needs. They use special easement machines (KWMI Manufacturing) to move hose reels long distances across properties and through the county's many canyons.

"They're powered by a gasoline engine and take the hose reels about 500 feet," says Smith. "Then we have another 300 feet we can take off the reel from there. It allows us to send out one or two

people to those jobs, instead of the three or four required to carry the heavy water-filled hoses."

The first set of easement machines bogged down in the mud, so the department ordered a new unit that crawls on a set of tank-like tracks.

One of the department's own innovations on the combination trucks is a lazy Susan device affixed to the side for storing aluminum vacuum tubes upright instead of carrying them on the bumper, where they're subject to damage. "General Equipment built the units for us to our specs," says Smith. "Now the crews just spin the platter and turn the next pipe toward them as they take them off the truck."

Complying with strict environmental regulations doesn't require CWS to regulate and stifle innovation within the department, notes Smith. "Our crews are pretty creative and we listen to their suggestions," he says. "We're also given enough freedom within the rules to choose the best equipment for the job." ✦

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Abel Recon's Sprayroq certified crew member applies SprayWall polyurethane lining to the prepared stormwater structure. (Photos courtesy of Abel Recon)

A sprayed-on structural coating enables rehabilitation of large stormwater pipes without traffic disruption and at major cost savings

By Mary Shafer

There's a word for traffic disruptions around Harrisburg, the Pennsylvania state capital: ugly. When two dual pipelines running deep beneath one of the area's busiest arteries showed signs of deterioration, no one wanted to repair it by conventional dig-and-replace methods.

Instead, the Pennsylvania Department of Transportation (PennDOT) settled on a trenchless solution involving a spray-on structural coating. The job saved months of traffic disruption and an estimated $2.6 million.

Harrisburg nestles between the eastern slopes of the Allegheny Mountains and the Cumberland Narrows of the Susquehanna River. The city of nearly 50,000 people is surrounded by small towns that the city's growth has absorbed.

Just across the river lies Camp Hill, home to the Book Clubs of America, which depends on Route 11/15 to transport inventory to and from its warehouses. Many other transportation-intensive businesses also rely on this artery, which runs along the river through the town of Wormleysburg.

The Harvey Taylor Bridge connects Route 11/15 (locally called North Front Street) with Harrisburg's busy downtown and government complex. Beneath this bridge on the Wormleysburg side is a culvert that collects water from a small tributary, along with storm runoff from the bridge. It sends this water directly into the river through a double-barrel set of 75-foot-long, 54-inch-diameter corrugated metal pipes.

About a half-mile southeast sits the John Wormley House Historic Site, home of the city's founder. Next to that site, a similar set of stormwater pipes, 88 feet long and 60 inches in diameter, drain out to the river.

This stretch of North Front Street carries some 17,000 vehicles per day. So when a PennDOT inspection revealed the beginnings of serious structural deterioration and crushing (deflection) in both sets of pipes, it was a nightmare scenario.

Digging not an option

"When we started this project in 2000, we tried to do it locally, in-house," recalls Nexa Giboyeaux, PennDOT highway design project manager. "Due to traffic control issues, we never finished. We could never replace those pipes." In 2007, Giboyeaux took control of the project, hiring the Larson Design Group engineering firm of Montoursville to analyze and solve the problem.

The firm found that the problem was the pipes' 20-foot depth. Replacement would mean digging a 10- by 20-foot trench on each site to enable upsizing of the pipes to box culverts — necessary to bring the pipes, laid in the mid-1940s, up to modern code standards. Then the trenches would have to be backfilled and road approaches milled and re-paved — all without compromising the environment or the historic site.

Even with detours, most of the work would have to be done at night to reduce traffic disruption. The job would entail 10 weeks of site preparation followed by excavation and replacement for each pipe — a total of nine months for all four pipes.

Charlie Mitzel, spray application technician, uses absorbent material to remove water from between the corrugations in the culvert before final drying of the pipe.

The project was estimated to cost $4.2 million — provided the culvert beneath the bridge would not also require upsizing. "If we had to replace those culverts, we probably would have had to upsize them for the new designs, probably to at least a box culvert," says Kevin Keefe, PennDOT assistant construction engineer. "Then, you're talking about an additional $700,000 to $1 million."

Giboyeaux directed Larson to research alternatives while she sought information on the Internet. Larson moved forward with the hydraulic study and flow impact reports on several options being considered.

"Just to give you an idea, with $2.6 million, we can pave probably around seven to eight miles, if we just overlay."

Nexa Giboyeaux

"We had a brainstorming session with PennDOT management," Giboyeaux says. "I gave some input, they gave some. We ran a few different scenarios and picked the top technologies that met our time, money, quality, safety, environmental and traffic impact requirements."

Viable choices included cured-in-place pipe (CIPP) lining and structural spray coating over pressure-jetted pipes and grout-filled voids.

Environmental concerns

PennDOT ultimately chose Sprayroq SprayWall polyurethane coating for its ability to strengthen and protect the structure. Application would not disrupt traffic. Because both sets of pipes were accessible to man entry, no trenches would be needed.

In addition — in keeping with the agency's green initiatives — the material would release no volatile organic chemicals (VOCs). Finally, the project would not release any debris or contaminants to the river. That meant it required no EPA permits — only Standard General Permits from the Department of Environmental Protection.

Abel Recon, infrastructure rehabilitation contractors based in Mountville, won the bid to apply the material.

The logistics of the two sites were not challenging. "We did the whole project with a spray truck, a prep truck and a pickup truck," says Hap Witmer, Abel Recon general manager. "We just parked them in normal parking spots alongside the road."

Abel Recon worked the sites with a crew of seven, taking hoses into the pipes from the tops of the culverts. The banks were not disturbed, and no restoration was needed. To prepare the site, workers built temporary walls and dikes using boards and sandbags to divert water from the work pipe into its twin. The pipes were already coated with coal-tar epoxy, commonly used on corrugated metal pipe to extend its life.

Joe Knight, spray application technician, applies SprayWall lining to the host pipe.

WIGGLING THE FOOT IN THE DOOR

Hap Witmer, general manager of Abel Recon, isn't one to let an opportunity pass him by. Once his company completed the Wormleysburg double pipe rehabilitation, he pursued more structural spray coating projects with PennDOT.

"I'm actually in the design phase for another corrugated pipe job," he says. "It's buried about 85 feet deep." When PennDOT built this road, which passes through a valley and then climbs a mountain, it laid a pipe to accommodate a stream at the valley bottom, then filled the rest in and paved over it. Now the pipe needs help.

Abel can access the 72-inch corrugated pipe by parking its trucks at the top of the hill and stretching hoses down to it. Crews will be able to prepare and spray it even though the trucks can't get down to the pipe.

The epoxy offered good adhesion for the coating, but Abel Recon needed to pressure-wash any loose material, using pressures from 2,000 to 3,000 psi. Technicians installed tightly woven "silt sacks" (catchment bags) at the pipe ends to catch debris and keep it from entering the river.

Night spraying

Next, workers used grout to restore the corrugated profile of the pipes near the exposed ends,

The foreground pipe is shown lined and is back in service while the other pipe has had its flow diverted while being prepared for lining. The pipes discharge directly to the Susquehanna River.

where air and moisture had pitted and eaten through the metal. "There were some pinholes and maybe some 1-inch holes, but other than that, the rest of it was in fairly good shape," says Witmer.

The surface preparation took a single 12-hour day shift for each pipe. Then the night shift sprayed on the polyurethane coating, applying it at a relatively uniform 500 mil thickness, based on the ASTM 1216 material design equation for structural integrity of materials. Uniformity was audited by American Testing of Lancaster.

Application proceeded at about 10 feet per hour. The team used about 15,000 pounds of material for all four pipes. Because the coating cured quickly, water flow was restored within minutes after application and thickness testing. Abel Recon crews worked around the clock. Pleasant May weather with a favorable curing temperature of 50 degrees helped smooth progress.

In the end, the project saved significant time, labor and money and avoided months of traffic disruption that would have aggravated motorists.

Cost benefits

The biggest benefit was cost reduction. "The original scope for the project was to replace these pipes, and do ADA ramps in the intersections to current standards," says Giboyeaux. "We'd have milled old pavement from the road, and then down into two inches of roadway. We'd have removed all that black material, then put down brand-new overlay on the road. With all that together, the budget scope was $4.2 million."

Instead, the pipe rehabilitation alone cost $275,500, and the entire project cost $1.4 million — a savings of $2.6 million. Rehabilitation of each dual pipe took about four days. "Just to give you an idea, with $2.6 million, we can pave probably around seven to eight miles, if we just overlay," says Giboyeaux.

"We minimized the traffic impact, minimized and in places eliminated environmental impact, and saved money and time, all with one quality product. Often we don't have the luxury to close down a road."

Witmer finds his own satisfaction in a job well done. "You know, to be able to work with PennDOT on new materials and, hopefully, help them do projects a lot cheaper than just their normal dig and replace — it's exciting." ✦

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LEAVE IT TO THE EXPERTS

Spot checks enable the City of Glendale to get to the root of SSO problems. Staff members take pride in their field responsibilities, training and certification

By Jim Force

The Wastewater Maintenance Section in the City of Glendale, Calif., has attacked the root of its sewer problems by letting the guys in the field do their thing.

Plagued by sanitary sewer overflows, most often caused by root intrusion, the section abandoned its program of scheduled line-by-line CCTV monitoring and adopted a "spot check" approach based on field observations from its maintenance crews.

The results have been spectacular. "In early 2005, we were seeing an SSO rate as high as 15 spills per 100 miles of sewer line," explains John Hicks, wastewater superintendent. "Since summer of 2008, we're down to an average of about 3.5 spills per 100 miles, and we've flat-lined at that rate. In fact, within the last year we've gone 100 days without an SSO — not bad for a collection system of this age."

Nice town

The 207,000 residents who enjoy the parks, art attractions, quaint restaurants and unique neighborhoods of Glendale know little about the hundreds of miles of sewers that lie beneath their suburban Los Angeles community. That is, until there's a problem. "Out here," says Hicks, "sewer overflows are simply unacceptable. Our goal is clean beaches and dry living rooms."

The Glendale collection system contains some 350 miles of sanitary sewers; 7,500 manholes; 1,350 catch basins; one large sanitary lift station; and two stormwater lift stations. Since much of the city slopes upward against the foothills of the

Rod Torres, senior wastewater maintenance worker, and Daniel Ori, wastewater maintenance trainee, set up a combination truck to jet and clean a storm drain. This Vactor truck is one of two such units owned by the City of Glendale. (Photography by Patrick Botz-Forbes)

Wastewater maintenance worker Jason Badgley lowers a cleaning nozzle into a manhole.

Members of the City of Glendale maintenance team are, from left, Roy Rodriguez, wastewater crew supervisor; Dave Martinez Jr., senior wastewater maintenance worker; John Hicks, wastewater superintendent; Rod Torres, senior wastewater maintenance worker; and Bryan Ortega, wastewater crew supervisor.

Verdugo Mountains, little pumping is required; gravity does most of the work. The Los Angeles Bureau of Sanitation's water reclamation plant just over the border treats the city's wastewater.

PROFILE:
City of Glendale, Calif., Public Works Department, Wastewater Maintenance Section

FOUNDED:
1884

INCORPORATED:
1906

POPULATION SERVED:
207,000

SERVICE AREA:
30.7 square miles

EMPLOYEES:
16

INFRASTRUCTURE:
350 miles of sanitary sewers; 1,350 catch basins; 7,500 manholes; 2 stormwater lift stations; 1 sanitary lift station

ANNUAL BUDGET:
$1.74 million

WEB SITE:
www.ci.glendale.ca.us

While the collection system is mid-sized by industry standards, it is old and often difficult to access because of steep sewer easements and rights of way off the street. It demands the full attention of Hicks and his leadership team of wastewater crew supervisors Bryan Ortega and Roy Rodriguez, and senior wastewater operators David Martinez, Jr. and Rod Torres.

Up to the middle of 2007, Hicks recalls, Glendale shared a CCTV platform (CUES) with sister communities Pasadena and Burbank. "But we terminated that arrangement about three years ago because each community needed one full-time," he says.

With its own CCTV unit and Granite XP survey software (CUES), Glendale began a regularly scheduled program of sewer inspection, moving through the system area by area. "We used it in what we call a district-survey mode, viewing our sewer lines from top to bottom in each of our 12 maintenance districts," says Hicks. "Our CCTV inspection was essentially divorced from our daily cleaning work, except when the crews ran into something."

Down, then back up

Glendale saw a dramatic decrease in overflows between the

GETTING RID OF GREASE

With more than 500 restaurants in town — some of them pretty ritzy — the City of Glendale Wastewater Maintenance Section must take special precautions about grease. A tough new FOG (fats, oils and grease) ordinance gives the city the legal authority it needs to limit the amount of these sewer clogging materials entering the system.

Senior operator Rod Torres is in charge of the section's "restaurant run" program. Using the section's Warthog cleaning nozzles, the wastewater section provides a cleaning of the main serving each restaurant at least once per year. The normal cycle time for cleaning any other line in the system not serving a restaurant is 18 to 24 months.

"We maintain a complete list of all the restaurants in the city and keep it updated," Torres says. "All restaurants are required to maintain an effective grease trap, as well as separate sinks for pots and pans, and we notify each establishment that their grease trap will be inspected on a regular basis."

The inspections are performed by the Public Works Environmental Division, which has two former members of the wastewater section on its staff. However, when grease is the cause of a stoppage or SSO, both groups work closely to investigate the exact source of the grease.

Torres says one reason for the inspections is to make sure every restaurant has an effective, approved grease trap. "We've had some issues where a food service establishment has installed a grease trap that really doesn't do the job," he says.

One of the best ways to get grease compliance is to get the restaurant manager to see that establishment's grease trap first-hand, Torres has found. "We take them out to the trap so they can physically see the amount of grease they are discharging," he says. "Their eyes get real big. It's good for them to see that and realize they may be responsible for a sewer backup in a nearby home or business."

"In early 2005, we were seeing an SSO rate as high as 15 spills per 100 miles of sewer line. Since summer of 2008, we're down to an average of about 3.5 spills per 100 miles, and we've flat-lined at that rate. In fact, within the last year we've gone 100 days without an SSO — not bad for a collection system of this age."

John Hicks

winter of 2005 and the winter of 2006. "For a time, we thought we were getting pretty good SSO reduction by just hydrojetting through the system faster," says Hicks. "But then in the spring of 2007 our SSOs shot up again, even though the cleaning regimen had not changed. We asked ourselves, 'What's going on?' We realized we were just not getting the root material out."

Facing the increase in overflows, Hicks and his team made a critical change in direction. "We decided that we would let the crews in the field determine where the CCTV inspection was most needed," Hicks says. "The crews now schedule post-cleaning spot-check inspections based on what they see in the tailings and feel at the hose-reel controls, not on some arbitrary decision by off-site supervisors."

The crews also recommend the most appropriate follow-up activity when they confirm a problem. "We developed a simple Word table in landscape form that the crews use to report their findings and recommendations," Hicks says. "It's a one-sided worksheet they file after a team member verifies that the follow-up is complete. It has worked out very well."

Cleaning them out

Crew supervisor Rodriguez explains the new cleaning protocol. "Our three flushing crews use a WG-1 Warthog jetting tool (StoneAge) to clean and proof the lines," he says. "The Warthog has an integral skid and uses high-speed rotation and a penetrating jet that can achieve 3,000 psi at 50 to 80 gpm.

"If they can't pass the Warthog, then they request the CCTV unit right away," he explains. "Once we have a look, we can determine what needs to be done — waterjetting, root trimming, or full-blown chemical root abatement."

The Glendale crew relies on a Vactor combination sewer cleaner for jetting and flushing, a root saw from Sewer Equipment Co. of America, a prowler easement machine from 3T Equipment, a sewer rodding machine from SRECO-Flexible, and service and support from local distributor Plumbers Depot Inc.

For chemical root abatement, Glendale relies on a private contractor from Visalia, Calif. Pacific Sewer Maintenance employs chemical foam that causes the roots to die-back and lose their capability to trap and retain debris.

"We bring in Pacific Sewer about twice a year, at a cost of about $1 a foot," says Martinez. "We budget $18,000 a year for the service. First we trim roots back as far as we can — that gives us a 7- to 8-week grace period. When the roots grow back, then the chemical foam is applied, using the contractor's jetter. We'll see significant die-off in about a month. We've yet to experience a stoppage in a chemically treated line."

Rodriguez observes, "We were down to an average of just one to two stoppages a month last year, and our goal this year is single-digit stoppages for the year."

Above: Wastewater maintenance worker Nery Villagran guides an inspection camera unit down a manhole to hunt for roots and other blockages. The camera vehicles use CUES Granite XP survey software. Right: An OZII camera with an Ultra Shorty transporter from CUES.

Reacting when needed

When a stoppage and an overflow do occur, Glendale is prepared for that, too. "We recently implemented standby crews, which are on call 24/7," Rodriguez says. "The crews are responsible for responding to an incident, restoring flow and filing the proper reports."

Ortega, who has more than 30 years' experience in sewer maintenance, thinks the quickness with which the Glendale section responds to emergencies may be unique. "I've been some places where you report an overflowing manhole, and three days later it's still running," he says. "Here, we take a lot of pride in getting there in a hurry — boom, boom."

In an after-hours callback situation, the team leader of a three-man response crew is expected to be on the scene within 30 minutes. "We've had homeowners really surprised at our response time," Ortega says. "It's been outstanding — limiting the amount of water that gets into the storm drain and preventing damage to homes."

When the Glendale crew finds a major defect in the system, it works closely with the city's Public Works Engineering Department to

The City of Glendale is proud that each member of the collection system team has earned certification in Collection System Maintenance through the California Water Environment Association. Inset: The spreadsheet collection system workers use to record information from spot checks of the system.

A Prowler easement machine from 3T Equipment helps the Glendale crew reach off-road locations for cleaning and inspection.

initiate repairs. "When we find a hole or a break," says Rodriguez, "it goes on a spreadsheet that is shared with the engineering group. It's classified A (fix now), B (fix soon), or C (watch)."

Hicks observes, "The support of the engineering group in getting the collection system repaired has been outstanding." For emergencies, Rodriguez can call in a repair crew under contract with the city. Response time is guaranteed to be between two and 24 hours. In a pinch, the Wastewater Maintenance Section works with heavy equipment operators from other city operations to make the repair.

Communication is key

Hicks notes that Rodriguez has done "a great job" keeping the engineering staff informed and showing them how much their efforts help reduce SSOs. Rodriguez meets face-to-face with the engineering department every three months to review what the sewer crews find in the field.

These are productive sessions. Rodriguez and Hicks recall that after the 1994 earthquake centered in nearby Northridge, federal funds became available for repairing sewer lines that had moved or were offset or broken. Glendale took part in that effort, but portions of the system are very old, dating to the early 1900s, and the lines still move and break on occasion. "It's an ongoing thing," says Hicks. Earthquake or not, his team continues to work with the engineering team to repair and upsize lines on an annual basis.

If all this teamwork and field responsibility suggests effective training and a strong sense of professionalism at Glendale, that's no accident. "I don't know if it's the poor economy or our reputation, but the last time we had an opening on our team, we had hundreds of applications," Hicks says.

Training is critical. Martinez and Hicks are working on an extensive training manual that is specific to Glendale's collection system and mirrors the one Glendale developed for its water department. "The manual is a guide for new employees, taking the entire operation and breaking it down step by step," Hicks says. "It will cover every phase of sewer maintenance, from using the Vactor unit, to hydroflushing, to safety procedures like proper use of respiratory equipment."

Each new hire must satisfy a one-year probationary period and successfully complete practical and written tests on each major section in the manual. Certification is another point of pride at Glendale. The city has invested much of the last four years getting the entire staff certified in Collection System Maintenance through the California Water Environment Association.

"We all hold certificates ranging from Grade 1 through Grade 4, with the exception of our latest hire, who is a wastewater trainee. Certification is not a state law yet, but we absolutely push everybody on the staff to get certified. At the end of the day, we want all members of our staff to feel like they are growing, advancing their knowledge, and participating in the professionalism of the section.

"Infrastructure jobs are desirable jobs. It's steady, good, honest work. The benefits are good, and technology has brought the work above the street. I don't know who coined that phrase, but it's true. You come for pay and benefits and you stay for growth and opportunity."

In Hicks' mind, sewer maintenance is very much a thinking man's game, preventing the next stoppage, and keeping the region's beaches clean and the residents' living rooms dry. ✦

"Infrastructure jobs are desirable jobs. It's steady, good, honest work. The benefits are good, and technology has brought the work above the street. I don't know who coined that phrase, but it's true. You come for pay and benefits and you stay for growth and opportunity."

John Hicks

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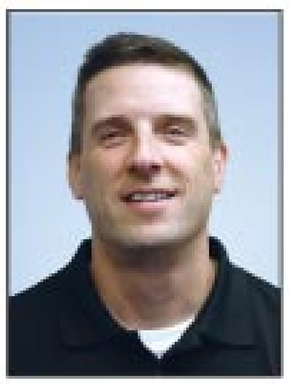
SPX Flow Technology offers a water and wastewater brochure with information on SPX filters, mixers, pumps, analyzers, metering instruments, heat exchangers and air treatment equipment for water and wastewater applications, including chemical makeup and storage. The brochure can be downloaded at www.spxflowtechnology.com/literature/index.asp.

Super Products Launches Product Web Site

Super Products' new Web site, www.superproductscorp.com, offers product information, detailed specifications and photo galleries for each of the company's main product lines: Supersucker industrial vacuum loaders, Camel sewer and catch basin cleaners and Mud Dog hydroexcavators. Other features include a Product Application Section (industrial cleaning, sewer cleaning and hydroexcavation) and a Dealer/Rep Locator.



Sam Miceli

Federal Signal Names VP, GM for Vactor, Guzzler

Federal Signal Environmental Solutions Group has appointed Sam Miceli vice president and general manager for its Guzzler and Vactor subsidiaries. Miceli will be responsible for overseeing and cultivating the business strategies and growth initiatives for both companies. He most recently served as plant manager for the Guzzler/Vactor facility in Streator, Ill., beginning his career with the company in 1993. Miceli has a master's of business administration degree from Bradley University and Bachelor of Science degree in industrial engineering from the University of Illinois.

Dvirka and Bartilucci Promote Raab to VP

Dvirka and Bartilucci Consulting Engineers has promoted Robert L. Raab to vice president. A member of the wastewater collection and treatment division, Raab has 35 years of environmental and civil engineering experience.

Robert L. Raab

LMK Technologies Expands Engineering Capabilities

LMK Technologies has increased its engineering capabilities with the addition of staff, 3D modeling software and CNC machining equipment. The 3-axis CNC vertical milling center can provide rapid and reproducible creations of precision components through the use of 3D software. An engineering staff is available to improve equipment, answer questions or help with specifying engineering firms and the project bidder.

Reed Manufacturing Adds Foreign Language Web Pages

Reed Manufacturing has added foreign language page options, including French, to its Web site, www.reedmfgco.com. Reed also has added a Spanish page for each Plastic Pipe Tools and Cutters & Cutter Wheels chapter. Other current or planned language pages include Chinese, German, Arabic and Italian.

Flow International Launches Web Site

Flow International has launched www.flowwaterjet.com. The site offers information and technical tips on waterjet cutting and surface preparation. Features include Ask Dr. Hashish, an interactive e-mail service, pictures and videos of waterjets cutting or cleaning and how they function.

ISCO Receives Workplace Safety Award

ISCO Industries, a Louisville-based distributor and fabricator of piping products, received a workplace safety award from its insurance company for being among the safest top 5 percent of companies. Award criteria includes workman's compensation losses over a three-year period, risk assessment by an independent auditor and participation in risk control workshops.

Vacall Introduces Virtual Walkabout

Vacall has released a virtual walkabout of its AllJetVac machines. The program can be accessed from a link on the Vacall home page, www.vacallindustries.com. The walkabouts feature an audio track and detailed photos that provide a guide to various components and their functions. The audio track also can be downloaded to an MP3 player.

RapidView IBAK Forms Technology Partnership

RapidView IBAK North America has formed a technology partnership with ProKASRO, manufacturer of pipeline rehabilitation equipment. The partnership enables ProKASRO's lining cutters to work with IBAK's inspection systems.

MaxLiner Launches Web Site

MaxLiner USA has launched a new Web site, www.maxlinerusa.com. The interactive site features products, services, news and frequently asked questions. ✦

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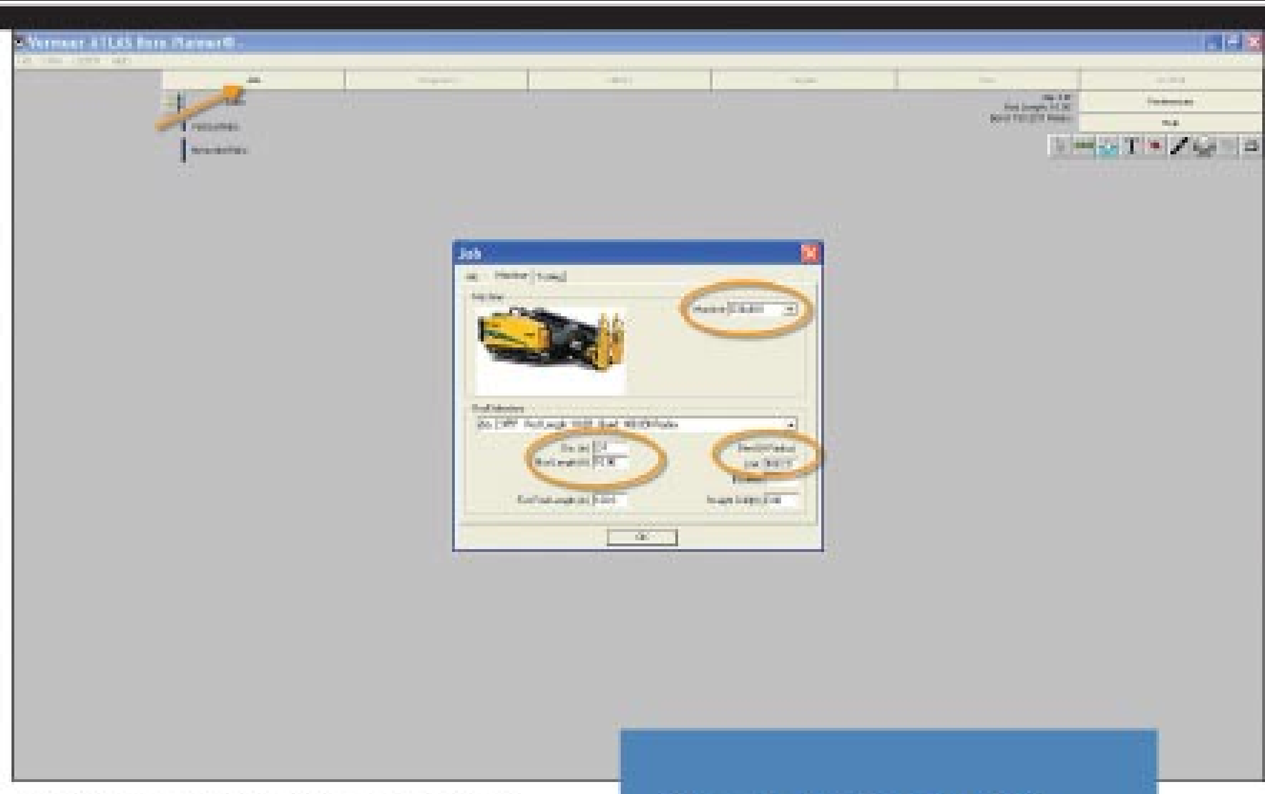

Figure 1. The Machine tab opens a window that displays a picture of the HDD machine to be used, along with its critical specifications. (Screenshots courtesy of Vermeer Corp.)

Bore planning software from Vermeer Corp. helps boost confidence for operators completing horizontal directional drilling projects

By Ted J. Rulseh

Horizontal directional drilling (HDD) can be an efficient and environmentally friendly way to install underground utilities.

However, the process becomes more difficult in varied topography, and as buried pipelines, fiber optics, cable and other types of infrastructure proliferate. To address this issue, HDD equipment manufacturers have developed bore planning software that helps drill operators chart safe courses for their projects.

In essence, the software lays the project out on a computer screen, giving the drill operator a visual roadmap to follow from entry to destination. The first programs were introduced about a decade ago, but they have begun to attract strong interest only in recent years, as the programs have become more sophisticated, and as more HDD projects must be executed in heavily developed areas.

HDD equipment maker Vermeer Corp. offers Atlas Bore Planner software as its planning tool. The software can be used to plan a bore using any manufacturer's HDD equipment. It is available for purchase and is offered on a free 14-day trial basis on the company's Web site.

Marvin Klein, a trenchless solutions specialist with Vermeer, demonstrated the program's capabilities by way of an Internet session on June 10.

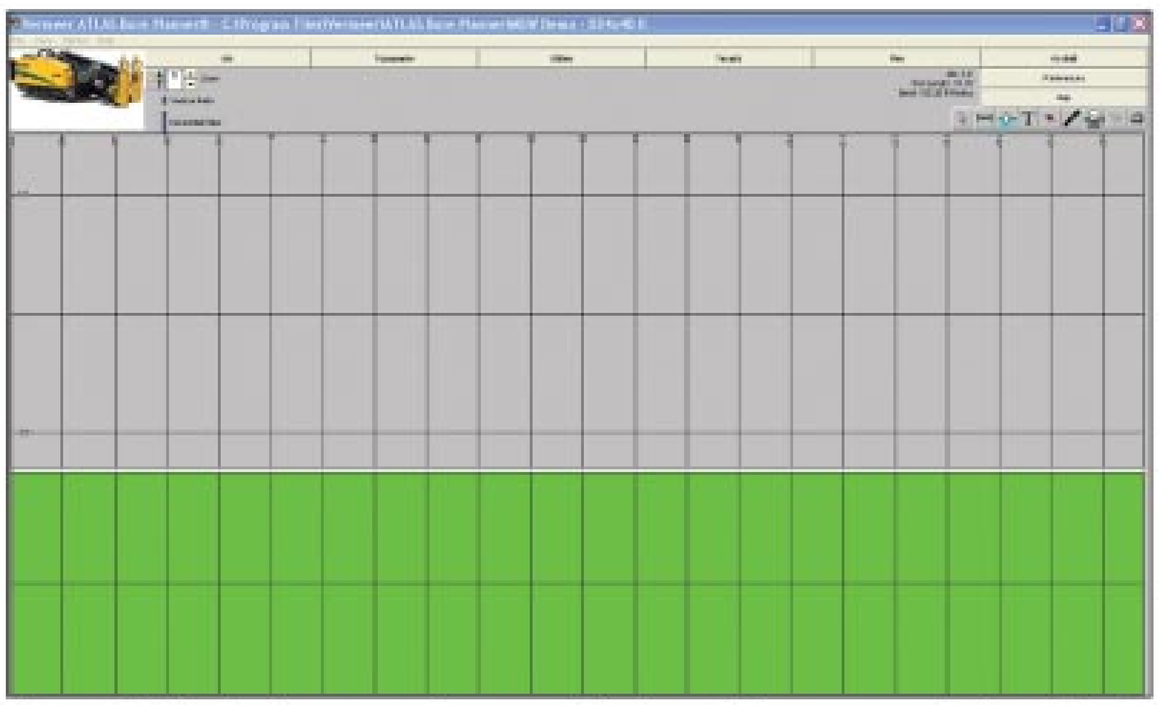

Figure 2. The basic screen shows a side view of the topography (gray) and a top-down view (green).

TECHNOLOGY TEST DRIVE

PRODUCT:
Atlas Bore Planner software

MANUFACTURER:
Vermeer Corp.

LOCATION OF DEMO:
Via Internet

DEMONSTRATED BY:
Marvin Klein, trenchless solutions specialist, Vermeer Corp.

LIST PRICE:
$2,800

Walk-around

Atlas Bore Planner is a Microsoft Windows-based tool, compatible with Windows 98, XP and Vista. Two versions are available: Atlas Bore Planner 3 and Atlas Bore Planner Pro. The only difference between the two is that the Pro version lets the user interface with the locating equipment used during drilling.

"If you're using Atlas Bore Planner Pro, and if you're using tracking equipment that logs the bore as you conduct it, you can download that data into the bore planning profile, and it will show you both the bore plan and the actual bore using the data points collected while drilling," Klein says.

The software has a simple configuration. Six tabs run across the top on the home screen, labeled Job, Topography, Utilities, Targets, Plan and As Built. At the upper right, a toolbar displays a series of tools that can be used to simplify the planning process.

As the sequential steps of the bore plan are completed, the lower two-thirds of the screen displays a graphical profile of the bore plan in side view and top-down view.

Operation

Klein opened the software and clicked on a Preferences button on the right side of the screen. This

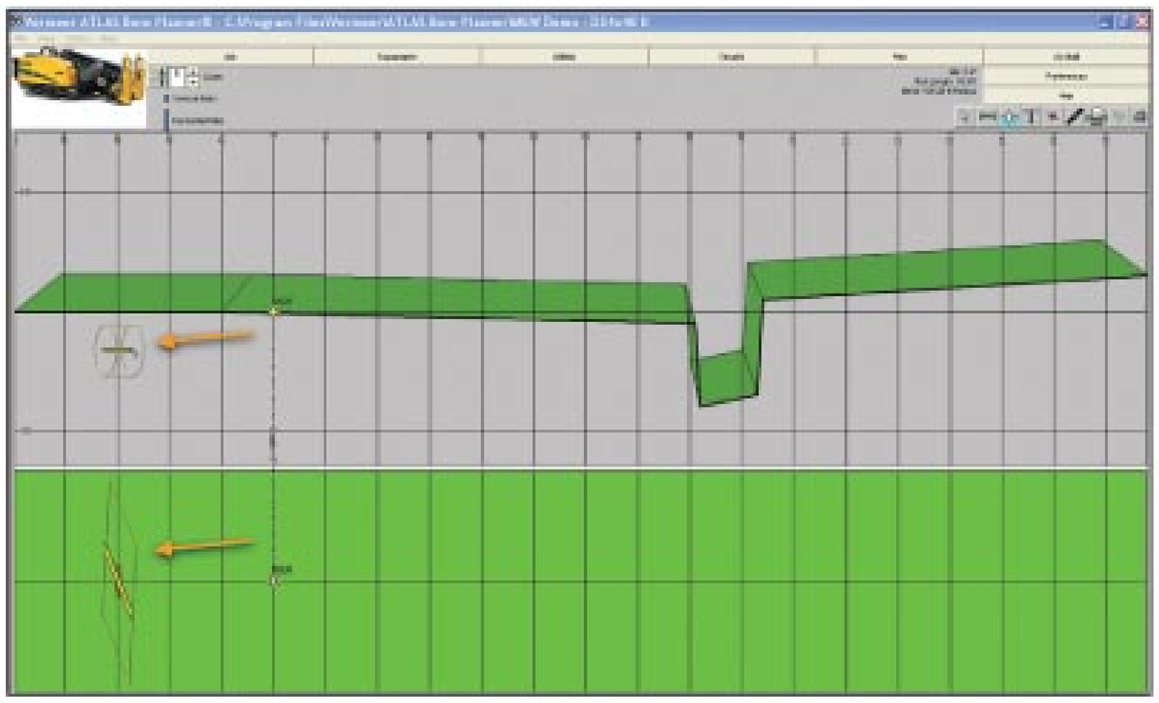

Figure 3. The location of a gas line (indicated by arrow) appears on the topography map.

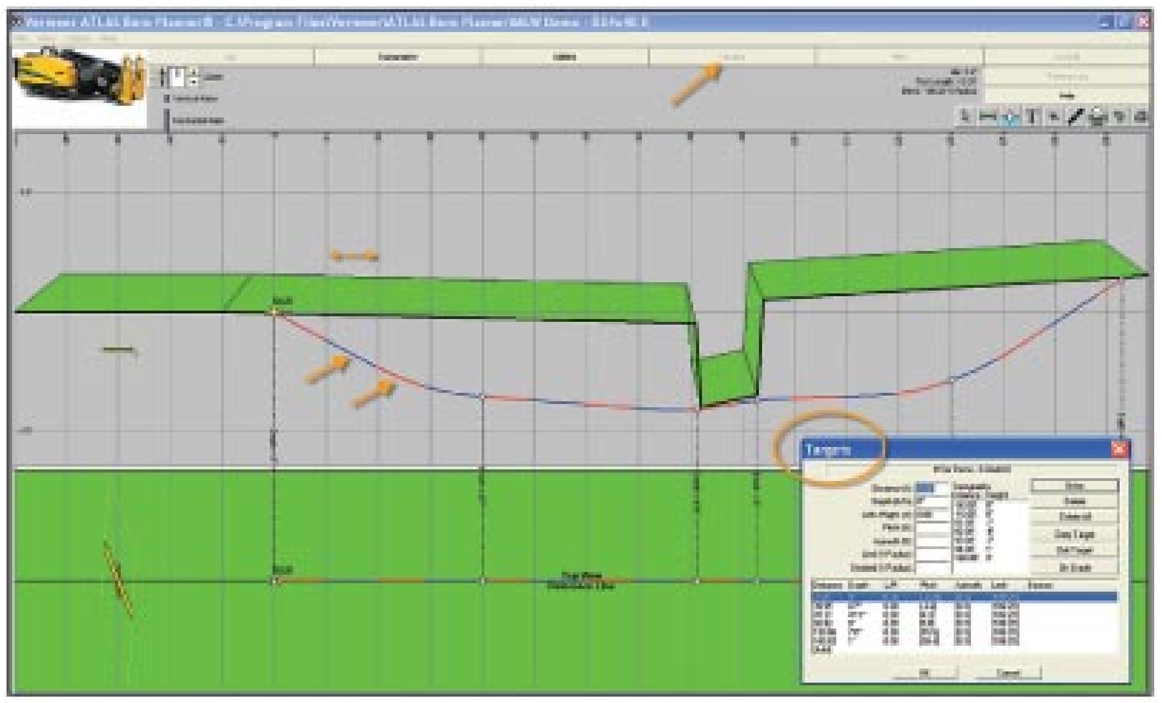

Figure 4. A proposed bore profile showing sections of drill rod (alternating colors).

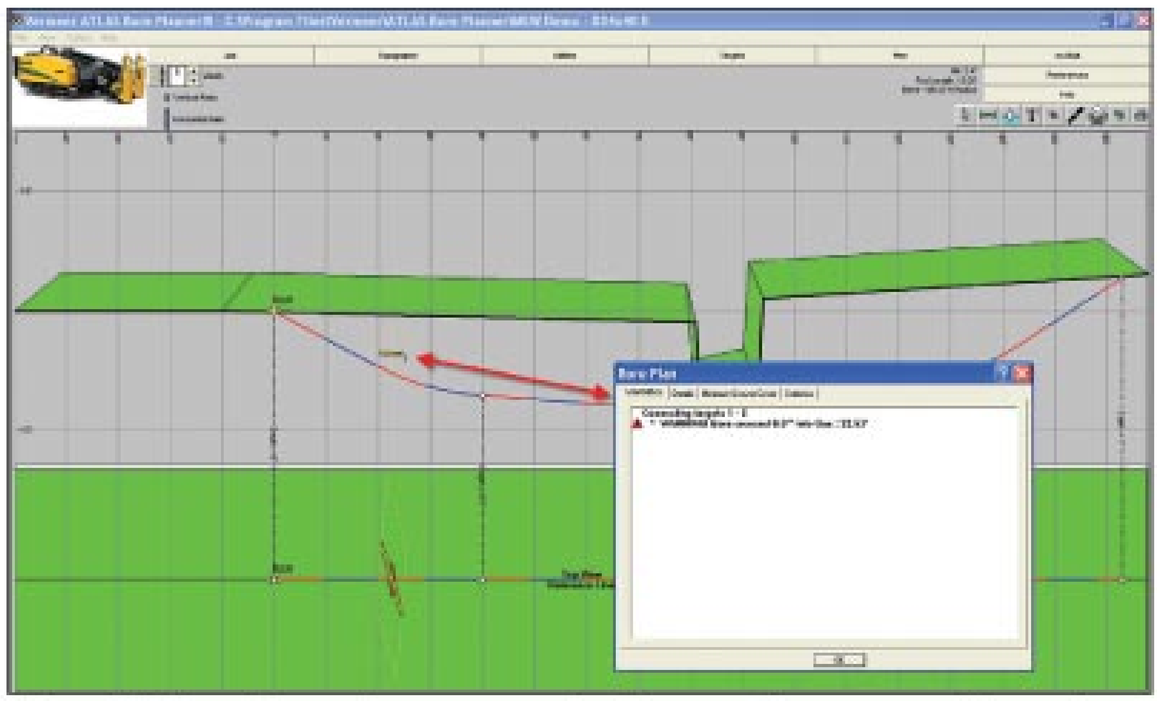

Figure 5. The software issues a warning because the proposed bore plan encroaches on the minimum clearance around a gas line (indicated by arrow).

menu lets the user:

- Select a language.
- Enter the name and address of the contractor or utility performing the bore.
- Select metric or English units.
- Specify degrees or percent of slope for working with topography.
- Define terms for deflection of the drill pipe (e.g. radius, angles per rod).

Klein then opened a Display box, selected a grid, and specified the grid measurements (10 feet per grid line).

To begin the bore plan, he clicked on the Job tab at the top of the screen — the only tab highlighted at this stage — and clicked an Add button. This brought up a box in which he entered a job name and specified the entry angle and minimum ground cover. The box also provided a space for entering notes.

Next, still working in the Job tab, Klein used a Machine tab to open a box and select the drill to be used for the bore. All Vermeer HDD machines are listed. When he selected the D24x40 Series II machine, a picture of that unit appeared on the left side of the screen, and a box appeared listing that machine's relevant specifications, including the bend radius of the drill rod (Figure 1). The user can also select Other and bring up a box in which to enter the specifications manually for any make and model of drill.

Still in the Job section, Klein clicked the Tooling tab and input the product pipe diameter, quantity and bend radius. "In planning a bore, it is essential to know whether the bend radius of the product is greater than that of the drill pipe," he said. "If the product pipe doesn't deflect as much as the drill rod, you need to use that as the limiting factor for planning the bore." Klein then entered the drill bit and reamer diameters and other tooling specifics.

When he closed out of the Job tab, all other tabs on the main screen were highlighted. Klein proceeded to the Topography tab and opened a box for entering topographic data, which normally would come from engineering drawings of the job site.

He specified the start point for the bore (0.0), and then a series of other data points, at specified distances from the entry point, to indicate topography changes, such as the top or bottom of a road ditch.

He also entered a point 50 feet back from the entry point to represent the setup distance for the drill rig. This process brought up a screen (Figure 2) with grid lines showing a side view of the topography (upper two-thirds of the display) and a top-down view (bottom third).

Klein then opened the Utilities tab and again used a box to enter information about buried utilities in the area. For illustration, he added a 4-inch natural gas pipeline running perpendicular to the bore path, 30 feet behind the bore start point, and 38 inches deep, and with a minimum clearance of 24 inches. He noted that utility locations would come from engineering drawings, a one-call service, or potholing and measuring on site.

The gas line (Figure 3) now appeared as a yellow dot on the side view of the bore plan with a dotted circle around it to represent the clearance. The path of the gas line also appeared on the top-down view of the site.

Next, Klein opened the Targets tab and entered the specific target points that would create the bore profile. As he did this, the side view of the topography remained on screen. As he placed targets, red and blue segments appeared on the bore path, each segment indicating a 10-foot section of drill pipe. When all targets were placed, the screen displayed the entire proposed bore profile (Figure 4).

When Klein clicked on the Plan tab, the software did not display the bore plan information. Instead, it displayed a warning, saying that the proposed bore path encroached on the 24-inch minimum clearance around the gas line (Figure 5).

After adjusting the bore profile, Klein clicked the Plan tab again. This time the program generated a list of information specific

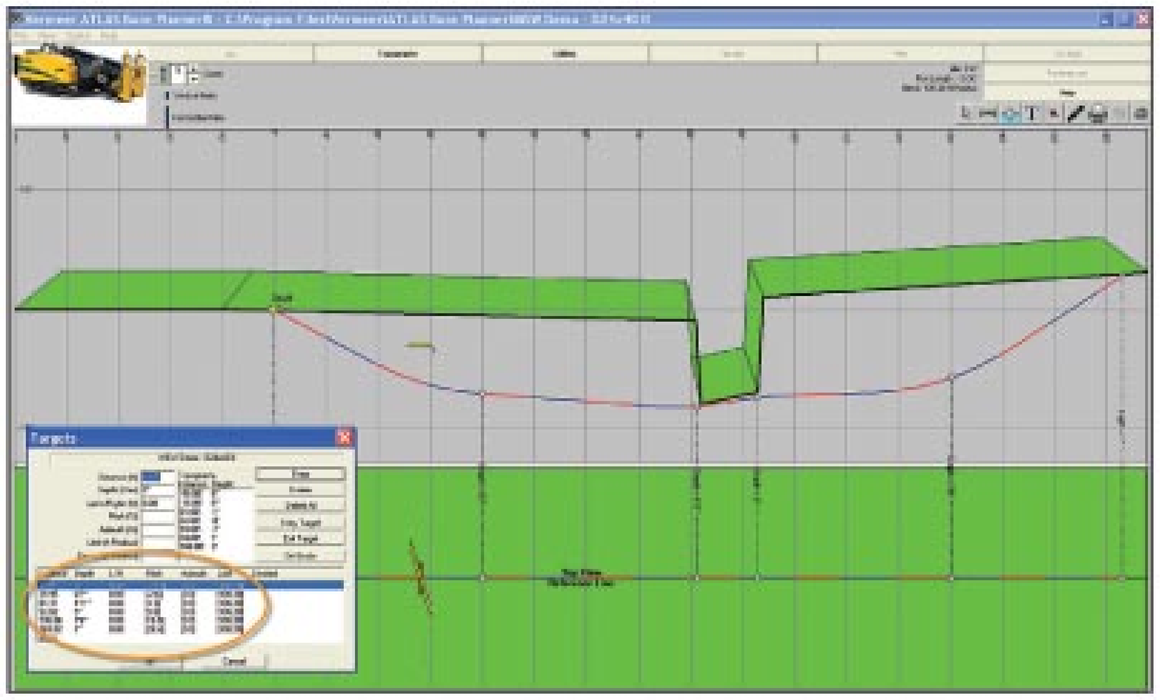

Figure 6. After adjustment of the bore plan to avoid the gas line, the program generates a new bore plan listing information (circled) specific to each individual section of drill rod to be used.

to each individual section of drill rod to be used, including length, distance out, depth, pitch and other data (Figure 6).

"This is one of the most beneficial pieces of the program for the driller," Klein said. "If an operator has to conduct a difficult bore and doesn't have any hard data to work from, you increase the risk of getting off track. Basically, this data gives him a roadmap."

Klein then demonstrated various features in the toolbar, which include:

- An arrow that allows drag-and-drop addition or movement of target points and allows quick display of data about the target. (He showed how moving a target point too far caused the red-and-blue bore profile line to disappear, indicating that the proposed path would cause the drill rod or product pipe bend radius to be exceeded.)
- A water icon used to add a body of water, such as a stream or pond.
- A utility icon for using drag-and-drop to add various types of utilities (using this function, Klein quickly added a fiber optic cable and sewer pipe to his sample bore profile).
- A skull-and-bones icon for deleting items, such as targets or utilities, from the bore profile diagram.
- A T icon for adding text notes on the diagram.
- A print icon for printing out the entire bore profile, or selected parts of it (topography, utilities, etc.).

Observer comments

The Atlas Bore Planner seems to provide a thorough yet simple process for planning HDD projects. One important aspect of drilling — soil and rock conditions — is not included. The operators must glean that information from geological reports and from observations on the site.

Apart from that, the tool appears to enable municipal workers or contractors to plan bores with considerable accuracy in a format that a technician could use proficiently with only a limited amount of training.

Manufacturer comments

Klein observes that while the Atlas computer program would be capable of accommodating geological information to show underground formations such as rock beds on screen, including such data would be complex due to the variability of geological conditions.

At the same time, he says, the bore plans are highly beneficial when drilling in rock because that is where accuracy is essential. "Once you start a rock bore and form the initial bore hole, it is difficult to get back on course should any unforeseen adjustments be necessary," he says. "But if you go into a rock bore with a plan from this tool already laid out, it will help your operator stay relatively close to the prescribed depths and pitch angles. And then you're going to be successful in putting the bore where it needs to be.

"If you're using Atlas Bore Planner Pro, and if you're using tracking equipment that logs the bore as you conduct it, you can download that data into the bore planning profile, and it will show you the bore plan and the actual bore using the data points collected while drilling."

Marvin Klein

"The biggest advantage of the tool is that it helps you create a plan before starting a project, and so minimize the element of risk. It's a very user-friendly program because you can input information in two different ways. You can go into the individual tabs and type the information in, or you can use the icons." ✦

MORE INFO:

Vermeer Corp.
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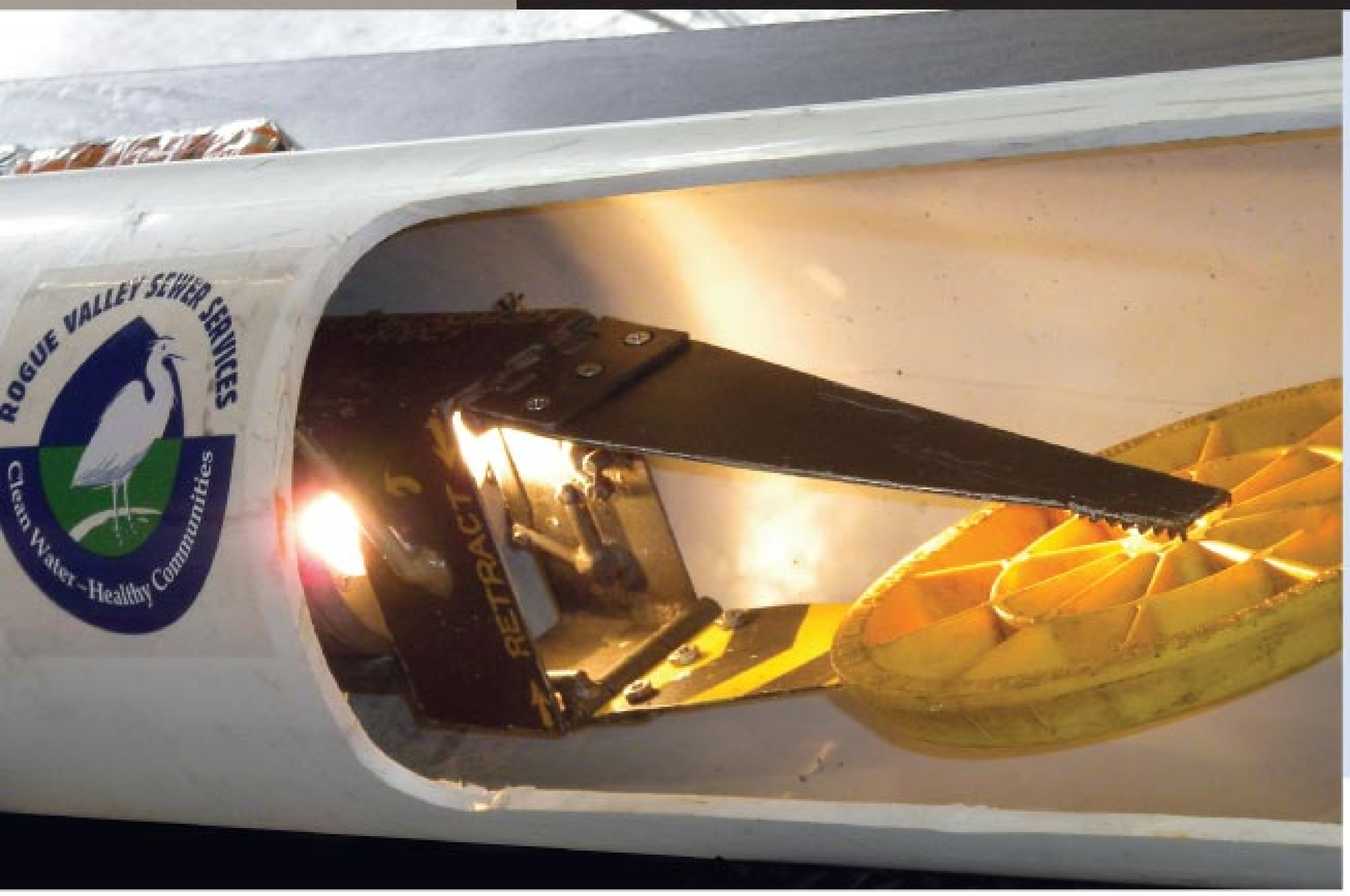


The Pipeline Piranha's 9.5-inch-long jaws with carbide chips glued on the ends grasp a 10-pound plastic mechanical plug. (Photos courtesy of Rogue Valley Sewer Services)

BETTER MOUSETRAPS

PRODUCT:
Pipeline Piranha

APPLICATION:
Retrieves items from sewer pipes

BENEFITS:
Saves time and cost vs. using vacuum trucks to flush objects out

USER:
Rogue Valley Sewer Services, Central Point, Ore.

WEB SITE:
www.rvss.us

JAWS OF INGENUITY

A homemade device enables a sanitary authority in southern Oregon to retrieve objects in 8-inch sewers without having to call in a vacuum truck

By Scottie Dayton

The Operations and Maintenance Department of Rogue Valley Sewer Services, a sanitary authority in Central Point, Ore., used to summon the vacuum truck crew to flush obstructions — at substantial expense — when an inspection team located them.

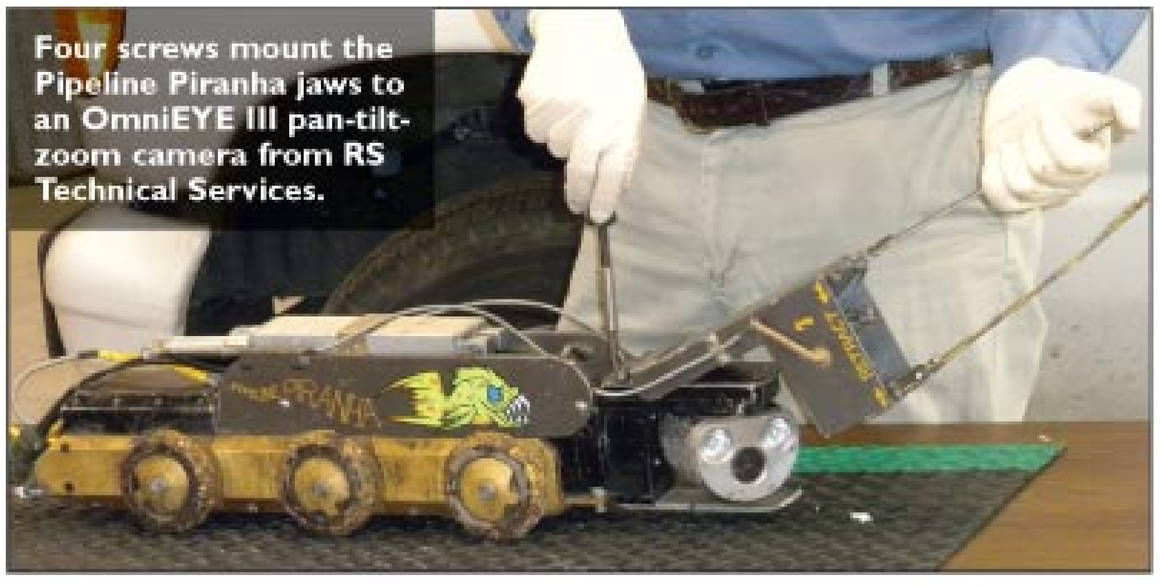
Plastic mechanical test plugs caused the major problem, either dangling or falling into the line as their wing nuts eroded. Lengths of broken PVC pipe, rocks, rags, and other debris also brought immediate action. The authority's goal is to inspect all 400 miles of the sewer system every five years and clean it every three years.

"It was frustrating to stare at a blockage right in front of the camera and be unable to reach out and grab it," says inspection crew leader Larry Rogers. Operations manager Terry Sackett agreed. They envisioned a grasping device but had no idea how to make it.

Then inspection technician Kevan Kerby joined the team. Based on his co-workers' idea and a lifetime of building moving objects with Lego blocks, he fabricated a tool mostly from scrap materials that retrieves items smaller than 8 inches and weighing less than 15 pounds. Since the Pipeline Piranha went on the prowl, the flusher crew is free to focus on its pipe-cleaning schedule.

Building blocks

Sackett set a $3,000 limit, including man-hours, on the project and gave Kerby a week to make a working prototype. "I spent many hours doodling as different mechanical ideas went through my mind," Kerby says. "The hardest part was



Four screws mount the Pipeline Piranha jaws to an OmniEYE III pan-tilt-zoom camera from RS Technical Services.

"I spent many hours doodling as different mechanical ideas went through my mind. The hardest part was keeping the design small enough to fit in an 8-inch pipe. We also wanted to build cheap in case it didn't work, so I looked for suitable materials in the shop."

Kevan Kerby

keeping the design small enough to fit in an 8-inch pipe. We also wanted to build cheap in case it didn't work, so I looked for suitable materials in the shop."

Kerby cut the base and jaws from 1/8-inch plate steel and used door hinges to make the jaws open and close. He made the jaws' operating linkage from rods welded together and some nuts and bolts. He bought two automotive choke cables to transfer power from the low-end electric actuators in the base to the jaws. The actuators and 400 feet of electrical cable were the only other purchased items. The materials cost $1,500.

"I scrapped the first attempt because the linkage was too short," says Kerby. "As I assembled the rods, I could see that the proportion of power to travel of the jaws was incorrect." He jury-rigged the wires of the second prototype to some batteries to test the device. It worked, and Kerby met the budget.

The 9.5-inch-long jaws open to 8 inches, close completely, exert 15 psi, and have carbide chips glued on the ends to increase their grip. Four screws mount the jaws to an OmniEYE III pan-tilt-zoom camera from RS Technical Services Inc. Another four screws mount the base to the TransSTAR tractor transporter, also from RS Technical Services.

"We plug the electrical cable into a socket in the inspection truck, then plug the other end into the cable reel," says Kerby. "It takes 10 minutes to set up the unit because it's basically plug and play." The electrical cable with reel weighs 80 pounds and feeds parallel to the transporter's single-conductor cable. The tractor can pull the combined weight 400 feet, the distance between most sewer access points.

Looking ahead

The Catch 22 in the project was the length of the jaws. The longer they are, the more leverage it takes to give them strength. "Our problem is that when the jaws are open, the camera shows us only their last two inches," says Rogers. "If they were any shorter, we couldn't see what we were doing. Because we used low-end actuators, they don't have much power, but it is enough to retrieve 5- to 10-pound mechanical plugs."

Inspection technician Quintyn Zilembo named and custom-painted the invention. Since the team deployed the Pipeline Piranha in March 2009, it has retrieved 10 fallen mechanical plugs and two dangling ones. "Occasionally, we lose a wheel off the transporter," says Rogers. "Now, instead of calling out the flusher crew or ordering a replacement, we'll bring it back with the Piranha. That also saves us a lot of money."

Zilembo is designing a new set of jaws he calls the Hammerhead. The lower jaw is contoured to the invert of the pipe to scoop up rocks and similar larger items more easily. The team also has ideas on how to streamline the Piranha's design and increase the strength of the jaws. The tool is patented. ✦

MORE INFO:

RS Technical Services Inc.
800/767-1974
www.rstechserv.com

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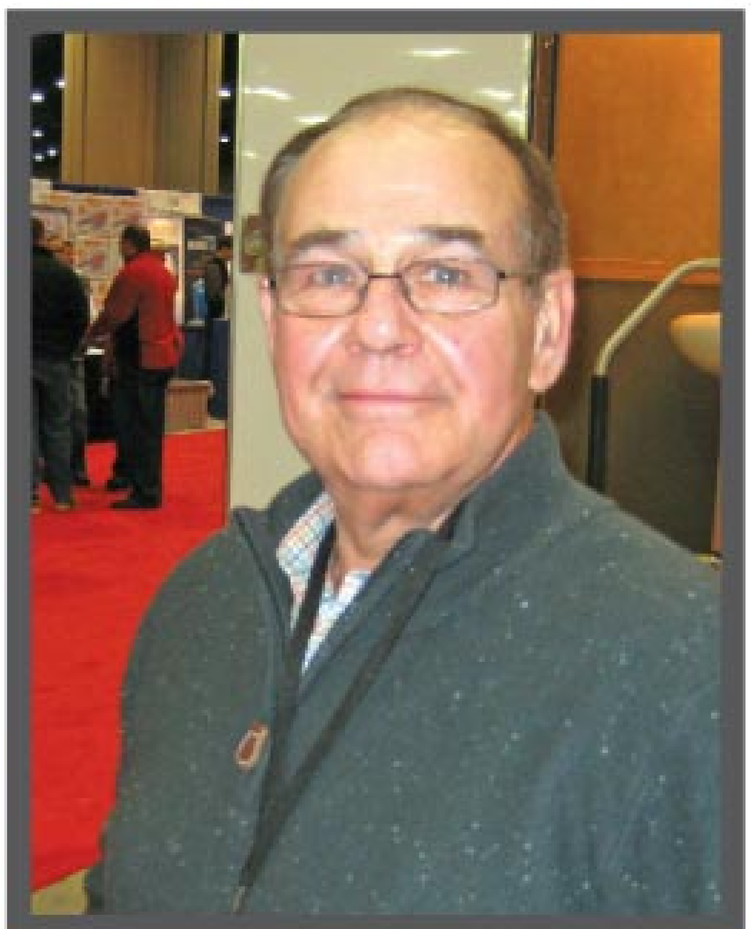

JACK BAILEY
Wind River Environmental
Hudson, Mass.

Jack Bailey loves networking with other business owners at the Expo. "It's an opportunity to see everything you need to see and meet everyone you need to meet," he says. "We've seen new technologies that might improve our business. It's good to come here and deal directly with vendors. It's the best way to get two or three different quotes. The Expo helps us create business deals, buy new equipment, and get the best prices."

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BRINGING THE MESSAGE HOME

A Minnesota group plans to develop its own educational program on the importance of maintaining water and wastewater infrastructure

By Ted J. Rulseh

The 2009 TV documentary, "Liquid Assets: The Story of our Water Infrastructure," sent a powerful message about the importance of water and wastewater infrastructure.

Now, a group in Minnesota hopes to personalize that message with a documentary for state residents. "Blueprint Minnesota: Liquid Assets" (www.BlueprintMN.com) is a grassroots initiative seeking to create a 30-minute public TV program that builds awareness about the critical role water infrastructure plays in protecting public health and promoting economic prosperity in the "Land of 10,000 Lakes."

Like the national "Liquid Assets" program, produced by Penn State Public Television and supported by major water, wastewater and other industry associations, the Minnesota program is a major team effort.

Among the leading instigators was Andrew Sullivan, a utility operator with the City of Eden Prairie, a southwest suburb of Minneapolis. Inspired mainly by the national "Liquid Assets" program, he helped pull together a group of organizations that deal with infrastructure (see sidebar) to begin discussion of a state-based program.

As of mid-summer, the project was still in its formative stages, but Sullivan and the team planned to cover topics such as the necessity and value of water infrastructure and the hazards of continued neglect; the watershed protection approach to building and sustaining infrastructure; the engineering challenge of building and maintaining water distribution, collection and treatment systems; modern rehabilitation solutions; and the financial and political challenges of getting vital infrastructure work done.

Sullivan talked about the Minnesota documentary project in an interview with *Municipal Sewer & Water* magazine.

***MSW:* Why did you become so interested in this project?**

Sullivan: I'm one of 12 people who take care of the water, storm and sanitary sewer systems in Eden Prairie. It's a great place to work. We have some very proactive leaders when it comes to infrastructure. We have goals, and we're held accountable.

I've been in this profession for about 20 years. I'm a guy who wears a hardhat and gloves, but I also really enjoy interacting with the public and contributing back to the industry that has given so much to me.

***MSW:* What led to the idea for a program on Minnesota's infrastructure?**

Sullivan: Our water and wastewater organizations here have often talked about what could happen if we all combined our efforts to build awareness about critical water infrastructure. For one thing, it's a way to combat what I call our competitors — the cable, gas, electric and phone companies.

They have $20 million advertising budgets. We use our budgets to make sure the infrastructure works, that people get clean water, and that their wastes are collected and treated without incident. It made sense for us to get together and combine our knowledge, resources and reach and go at this.

What helped kick it off was seeing the "Liquid Assets" program created by Penn State. Those guys knocked it out of the park. Their program is about an hour long, and it's fantastic. So we started lobbying Twin Cities Public Television, because we thought that was something the public should see more of.

They said they liked the "Liquid Assets" program, too. They ran it once, and then they said, "Why not a Minnesota version?" So we invited our infrastructure leaders to a meeting. They all showed up and said, "Heck yeah, let's give it a go."

(Photo courtesy of Andrew Sullivan)

Andrew Sullivan

"I'm in a position where I deal directly with customers. I'm in their homes, hovering over their meters while they look over my shoulder. I talk to them about how the water enters the house and how it leaves the house. I used to think people didn't care, but man, they are very interested."

Andrew Sullivan

***MSW:* What is the state of Minnesota's infrastructure today?**

Sullivan: According to the American Society of Civil Engineers' Report Card for America's Infrastructure, our state's water systems need investments of $5.46 billion over the next 20 years, and the wastewater systems need $2.73 billion in the same time period.

Minnesota is known as the "Land of 10,000 Lakes," but it's really the land of more than 12,000 lakes, the freshwater sea we call Lake Superior, 10.6 million acres of wetlands, the headwaters of the Mississippi River, and 69,200 miles of natural rivers and streams. We take our water pretty seriously here, and our critical water infrastructure plays a role in that.

***MSW:* Do you think the public is truly interested in infrastructure?**

Sullivan: Definitely. I'm in a position where I deal directly with customers. I'm in their homes, hovering over their meters while they look over my shoulder. I talk to them about how the water enters the house and how it leaves the house. I used to think people didn't care, but man, they are very interested.

They'll watch me dig holes in the yard and find the curb stops, and if I'm opening up a manhole, they're peering in and asking where the water goes. Contrary to

WHO'S BEHIND THE BLUEPRINT?

The Blueprint Minnesota: Liquid Assets group has a diverse group of sponsors and partner organizations with interests in healthy water and wastewater infrastructure. They include:

- Advanced Engineering and Environmental Services Inc. (sponsor)
- American Planning Association of Minnesota (sponsor and partner)
- American Public Works Association Minnesota Chapter (sponsor and partner)
- American Society of Civil Engineers Duluth Section (sponsor and partner)
- American Society of Civil Engineers Minnesota Section (sponsor and partner)
- American Water Works Association (partner)
- Central States Water Environment Association Minnesota Section (sponsor and partner)
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- Minnesota Department of Public Health (partner)
- Minnesota Rural Water Association (sponsor and partner)
- Stanley Consultants Inc. (sponsor)
- Suburban Utilities Superintendents Association (partner)
- Twin Cities Public Television (partner)

popular belief, I think people are fascinated by how things work.

***MSW*: How much of an in-depth look do you plan to take in this program?**

Sullivan: We'd like to give the folks a quick overview of everything, from the treatment plants, to the piping and manholes and pumps. We'll talk about the important role infrastructure plays in health, the environment and the economy, what it takes to keep infrastructure working, and the repercussions of not taking the proactive approach that Minnesota is known for.

The organizations working on this project definitely have a vision for what things should look like in the 21st century, and it will be nice to share that with the public. We looked around at some other states that have had problems, and we realized we can't let that happen here. Right now, we are at a crossroads where you ask yourself: Do you love infrastructure or do you leave it? Embrace it or ignore it?

***MSW*: Are you optimistic about the future of Minnesota's infrastructure?**

Sullivan: Yes. We're fortunate today to have GIS and GPS technology. It helps us answer the three most important questions in infrastructure: What do I have? Where is it? What is its condition? Now we can pull out laptops in our trucks and see all that, so when it's time for budgeting, we can see what we have in the ground, and what work needs to be done, and budget that in.

We're also lucky to have trenchless technologies that often let us do work at a fraction of the cost compared to the old days. So we're optimistic about what we can do, but we have to get the public behind us, too.

***MSW*: How and when did work on this project actually begin?**

Sullivan: It began in spring of 2009. I got on the phone and got all the groups on board. We held our first meeting shortly after and it really got rolling by fall. Once Twin Cities Public Television said they were willing to partner with us, it wasn't hard to talk anyone into getting involved.

***MSW*: What basic approach are you taking to this documentary program?**

Sullivan: We've asked all the partners to come up with examples of failures and successes. We don't want to get too "doomsday," but it needs to be about real problems, real solutions, and real people.

For filming, we're going to do something very interesting. Twin Cities Public Television held a seminar to train some of our people to use basic handheld video cameras that are compatible with their editing environment. People in our profession will use those cameras to film many of the segments. We can certainly get access to sites more readily than a TV crew could, since we work around the infrastructure every day.

We put out an all-call, and we got a terrific response from people wanting to help. We have some very passionate people out on the front lines who are not afraid of the video technology. Meanwhile, Public TV people will shoot the interviews with experts.

***MSW*: What sort of funding does it take to create a program like this?**

Sullivan: Our goal is to raise $30,000. The handheld cameras are going to save us considerable time and money, as well. We're glad Twin Cities Public Television was able to work with their unions to allow us to do that. Of course, Public TV, as one of our partners, is contributing substantially to the production.

***MSW*: Besides raising awareness of the infrastructure itself, do you see this program raising the profile of the people who take care of it?**

Sullivan: This is certainly a shot in the arm for the people out there making infrastructure function every day. In general, the only time they are seen and heard of is when infrastructure fails. That's no way for the public to get to know their infrastructure, and no way for us to get to know the public. It'll be good for the people who take care of infrastructure to have a part in sharing this with the public. It reinforces the importance of the roles we play.

***MSW*: Besides putting this program on TV, how do you envision using it?**

Sullivan: Our people will be able to pop in this DVD in front of a council meeting, or even have a special community get-together where residents can watch it and then deal with the tough questions: What is the condition of *our* infrastructure? What is it going to take to fix what we have?

We'll also design it so that it can stand alone, or we can chapter it out and play pieces of it on YouTube, and post them live on community Web sites. We're looking at airing it on local access cable. There are lots of directions we can take this.

"This is certainly a shot in the arm for the people out there making infrastructure function every day. In general, the only time they are seen and heard of is when infrastructure fails. That's no way for the public to get to know their infrastructure, and no way for us to get to know the public."

Andrew Sullivan

***MSW*: Did your group take any lessons from the collapse of the I-35W bridge in the Twin Cities in 2007?**

Sullivan: That was a wake-up call. It's scary. An analogy has been made that we have infrastructure that's just as critical right under our feet, that is older and in worse shape and can have the same if not worse consequences if it fails.

***MSW*: Do you see other states in the future doing something such as Minnesota is now doing with this documentary?**

Sullivan: Long-term, we're hoping that will happen. Infrastructure is something people only notice when it fails, and when it does, it always seems to happen to someone else. When they see that it's their state and their community it becomes a whole different story. That's powerful stuff. ✦

MAINTAINING QUALITY

PACP has become the industry standard in TV data collection. Now the industry must ensure that the standards are met consistently.

By Ted DeBoda, P.E.

In the March edition of NASSCO Corner, my predecessor Irvin Gemora communicated the importance of verifying the credentials of contractors certified in NASSCO's Pipeline Assessment Certification Program (PACP).

As NASSCO's newly appointed executive director, I plan to bring a number of important initiatives to fruition, and one of them is maintaining the integrity and quality of PACP. Besides ensuring that the people doing the work are truly PACP-certified, a larger area for concern is the potentially decreasing quality of pipeline assessments completed under PACP.

For example, consultants are expending excessive quality assurance/quality control (QA/QC) costs to review video and data just to make sure they meet PACP standards. When these deliverables do not meet PACP standards, they must be revised to meet customer specifications, as well as to provide a satisfactory assessment of the pipelines. These are issues that will remain at the top of my agenda.

NASSCO has a responsibility to the industry to maintain the quality of training and provide trainers and operators with the tools to meet PACP requirements.

NASSCO introduced PACP in 2001, and it has become the national standard for the collection of CCTV data, revolutionizing the pipeline assessment industry. But as with any set of standards, PACP needs to be monitored to make sure standards are met consistently and completely.

NASSCO has a responsibility to the industry to maintain the quality of training and provide trainers and operators with the tools to meet PACP requirements. Steps we are taking include:

- Improving the level of the PACP training by adding videos and practical exercises.
- Formalizing the recertification process to include online components as well as proctored testing in locations in and near all metropolitan areas.
- Providing online exercises accessible to all PACP-certified operators for practice and reference.
- Assessing in-house training to ensure that it meets NASSCO standards.

NASSCO is not alone in this effort. As an industry, we need to take the appropriate steps to minimize the level of substandard work that is packaged as PACP compliant. These efforts include:

- Providing appropriate levels of QA/QC before deliverables are considered complete.
- Neither submitting, nor accepting, nor approving payment of substandard work.
- Training operators by pointing out errors found during QA/QC (operators do not want to perform substandard work).
- Ensuring the quality of in-house training, without which none of the other steps matter.

Not everyone will be happy with these steps. Training and QA/QC efforts can detract from short-term productivity goals and can add expense. However, these efforts always have long-term benefits that far outweigh short-term goals.

As PACP matures, our industry as a whole needs to understand the challenges involved with obtaining PACP-compliant data and reports, and take responsibility in making sure CCTV providers are properly trained and held accountable to meet PACP standards. ✦

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

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Florida Plumbing & Sewer Business For Sale. Established in 1969, owner is moving on. Nearly 8,000 customers in database including some contracted. Business grosses in excess of $1 million. Extensive equipment including septic, Guzzler and Safe Jet trucks. Equipment has been featured in Cleaner magazine. **Asking price is 649,000, make an offer.**

Dallas/Fort Worth Texas Area Sewer/Rehab Business For Sale. Drain Cleaning, TV inspection, Pipeline & Manhole Rehab/Relining, Municipal Cleaning and Maintenance business for sale. Excellent opportunity to expand or start your own business. Good revenue history and priced to sell. Includes all equipment to get started. **Asking $150,000.**

South Florida Commercial Real Estate, Plumbing & Sewer Business For Sale. Established in 1969, owner is moving on. Nearly 8,000 customers in database including some contracted. Established name with real estate on turnpike. Real estate appraised in excess of $2 million, business grosses in excess of $1 million, close to $1 million in equipment including Vactor, Guzzler and Safe Jet trucks. Equipment has been featured in Cleaner magazine. Assumable SBA loan for bulk of selling price. **$2,799,000 for the entire package.**

Northern Minnesota Septic & Drain Cleaning Business For Sale. Established in 1965, owner is retiring. 3,500 customers including some contracted. Well-established name for 45+ years. Real estate available for additional fee that adjoins municipal dump site. Hunt, fish, snowmobile right out your back door. **Affordably priced at $50,000.**

Chicago-Area Biosolids, Land Application, Dredging and Industrial Services Business. Established in 1985, owner is retiring. Reputable business includes real estate servicing the entire Chicagoland area with sludge and biosolids disposal and treatment services. Real estate and shop included with sale valued at $750,000, business grosses in excess of $3 million annually, $6.3 million in equipment and assets including several TerraGators, Vac Trailers, dump trailers, loaders and much more. **$4,900,000.** Huge potential, good profit and priced right. Non-Disclosure Agreement required, all P&L statements, list of assets, and financials available to qualified buyers.

Texas Septic and Sewer Business. Grossing in excess of $1,000,000 annually. Includes 2007 2500 gallon septic truck, 1995 2500 gallon septic truck, 2007 and 2008 Chevy service trucks, portable restrooms and more. 430 contracted customers. **$799,000.**

North Carolina Septic Business. Grossing in excess of $125,000 annually. Includes 2,000 gallon service truck, backhoe, jetters and more. **$110,000.**

Massachusetts Sewer & Drain Franchise For Sale. Confidential listing, Non Disclosure Agreement required. Turn-key business, good revenue. **Asking $165,000.**

New Jersey VIP Restroom/ Portable Toilet Business. Servicing Metro Philadelphia and Southwest New Jersey with VIP restroom trailers and portables. Many late model assets including 2 nice service trucks, 1 back-up service truck, pick-up truck, 4 VIP restroom trailers, nearly 300 restrooms, sinks, holding tanks, slide-in unit, 2 forklifts, and more. Assets worth over $300,000 - priced to sell at **$399,000.**

Green Bay, Wisconsin Area Septic & Drain Business. Solid and steady revenue history and nearly 20 years established. Excellent opportunity to expand or start your own business. Includes very well-maintained 3,800 gallon septic service truck, fully outfitted 2002 Chevy drain service van, drain & sewer equipment, all office equipment and computers, 2,700+ customer list, and more - a true turn-key or easy expansion opportunity. Very meticulously maintained equipment all kept inside a heated shop. Current owner is retiring. Large shop and real estate is also available if desired at additional cost. **Asking $249,000.**

Allentown, Pennsylvania Area Sewer Business. Specializing in collection systems, video inspection, jetting, municipal work. Includes CUES TV & grout truck, Sewer Equipment Corporation jetter truck, Vactor 2100, RIDGID camera, confined space equipment and more! Good revenue history. Great opportunity to expand or start your own business. Current owner wants to retire. **$330,000.**

Wanted. Very serious and well qualified buyer looking for sewer, septic or industrial business in Dallas, Texas area. Must be grossing between $500,000-$1,000,000. All inquiries are kept confidential.

www.btwo.biz • jeffb@colepublishing.com • 800-257-7222

FINDING NEW WAYS

Managers who need better ideas to improve performance should identify and nurture the innovators and risk-takers on their teams

By Ken Wysocky

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.

These days, managers who are constantly challenged to do more with less must innovate to survive and thrive. But to find new ways of doing things, they first should take an objective look at their team and make a critical determination: Which employees are creative risk-takers and which ones aren't?

The difference is mission-critical. Asking risk-takers just to implement changes, not help develop them, is to court failure and risk losing valuable employees who feel under-utilized. And expecting novel ideas from sustainers — those who simply enjoy doing the tried-and-true — could result in a blank slate.

"It's helpful to see where people are at so you can assign projects in ways that help them be more successful," says Linda Draze, training director for the State of Minnesota. "You might put a risk-taker on a team to come up with new ideas to solve a problem, but not on a team to implement ideas."

Are you an innovator?

This applies to managers, too. A self-aware manager must know how his or her approach may affect other people. So if you're a "new-idea-a-minute" person surrounded by a team of sustainers, you probably need to take more time to introduce new ideas.

"On the other hand, if someone on your team is always going in five different directions at one time, it's not that they're not listening to you or can't take direction," says Draze. "It's just that they have a high degree of creativity, and one of the benefits is new ideas all the time. So figure out how to communicate with that person. Find the best way to lead them.

"I'm almost embarrassed to admit this, but it wasn't until I was in my 40s that I discovered an important managerial truth — that a conductor is the only person in an orchestra who doesn't make a sound.

"Managers are like conductors in that they need all these people to play different parts, and must lead them. And most effective leaders do it rather quietly. They don't expect people to behave in ways they can't. They don't put two sustainers in a room and ask them to brainstorm ways to solve a problem creatively. Such people are just not wired to come up with creative ideas."

Consult the Creatrix

To help managers figure out where their staff members lie on the innovation scale, Draze suggests using the Creatrix, a tool developed by the Richard Byrd Co., an employee-development consulting firm. By analyzing the answers to a set of questions, managers can see where their direct reports fall among eight categories: dreamer, risk-taker, innovator, challenger, modifier, practicalizer, planner or synthesizer.

Employees who fall to the left side of the matrix are more likely to suggest ideas involving incremental changes in processes and operations. Employees on the right side tend to combine concepts and ideas and see relationships between things that others typically wouldn't consider. In other words, they're true innovators, and only 5 percent of people fall into this category, according to Creatrix research.

"Some might score high on risk-taking but low on creativity, while others may be the first to criticize an idea, but may not have a better idea of their own," Draze says. "On the lower side of the scale are sustainers, who don't like risks and aren't creative."

On the flip side, managers should encourage sustainers or others who rank low on the innovation matrix, but who want the chance to become more creative. "It's absolutely fine if people want to step outside their comfort zone and go from sustainer to innovator — it can be taught," Draze says.

"I've had several people who come out as sustainers on the matrix and they're surprised and depressed.

"Too often, we don't want to take risks because we might get bad press when something backfires. But innovation is essential if you're going to meet the challenges in front of you. We need to find new ways of doing things in order to better serve the public."

Linda Draze

There is no right or wrong on the matrix — just shades and degrees of risk-taking. Whether employees are sustainers, challengers or innovators, each has strengths that add value. However, older and more established organizations tend to have fewer risk-takers because they develop rules and bureaucracies that stifle creativity, drive away innovators, and leave behind sustainers.

Managing sustainers

Should managers be concerned that sustainers who play second fiddle to innovators when it comes to problem-solving assignments will become resentful? Not really, Draze says. Most often, sustainers feel better staying in their comfort zone. They don't want to be labeled as uncreative. It turns out that many people labeled as sustainers can't be risk-takers because of the nature of their jobs. Being a sustainer doesn't mean you're stubborn or resistant to change."

Go get creative

After identifying the innovators, a manager's job is to let them go to work. Draze says the most effective innovation comes when people dig deep and delve into the actual problem, not just the symptoms. Finding the real problem may involve restating it and reframing it several times.

"Sometimes we're under the gun for a solution, so we look at the symptoms and solve those, rather than getting to the real cause of

the problem," Draze says. Team members should also consider what might be blocking true out-of-the-box thinking: fear of the unknown, old habits, old rules they're afraid to break, general complacency, old assumptions, and worries about being challenged or questioned.

Inevitably, debate reaches what Draze calls the "groan zone," where people become frustrated with one another and where they are in the process. "You need to go through the groan zone to the other side, where you can make a decision," she says. The results — innovative ideas — are well worth the effort.

"When some of us think of innovation, we equate it with efficiency," Draze says. "But that's only half of the equation. The other half is risk-taking. Too often, we don't want to take risks because we might get bad press when something backfires. But innovation is essential if you're going to meet the challenges in front of you. We need to find new ways of doing things in order to better serve the public." ✦

Product Spotlight

Crawler Offers Continuous Track, One-Piece Design

By Ed Wodalski

Model 636-S from TV Ferret

The Model 636-S steerable stainless steel pan-and-tilt inspection camera and crawler from TV Ferret is designed to inspect 6- to 36-inch pipes. The one- piece submersible unit has a solid tube end-cap design to prevent leakage.

The 6-inch steerable crawler has a continuous knobbed urethane track for added traction. "It's set up like a tank," says company owner Rich von Ahn. "With a track system, you always have some sort of surface contact, whereas with a six-wheel design, you have gaps between the wheels. And if you have an offset joint you can maneuver over it better with the track."

Full differential steering enables the crawler to rotate on its axis. The stainless steel articulating cable receptor alleviates stress on the main cable and is designed for quick, easy connection without tools. Measuring 26 inches long and weighing 45 pounds, the crawler is shorter and lighter than previous models for easier manhole entry and better maneuverability around tight curves.

One power switch turns the entire system on. "The controls are designed to prevent blowing your lights or blowing a motor," says von Ahn. "This prevents operator error. You're talking industrial equipment. The name of the game is it's got to be tough."

Two independent, permanent magnet motors propel the all-gear-drive train. A modular lift-wheel system attaches to the outside of the crawler for inspecting larger pipe. The pan-and-tilt camera head has ultra-bright LEDs that can illuminate a 12-foot pipe and can rotate 360 degrees with 300 degrees of pan viewing ability.

The camera offers 470 lines of resolution and has 1.0 lux sensitivity and an auto iris for a brighter image. Options include an industry-standard 512 Hz locating sonde, rear viewing backup camera, internal-pressure monitor, pan-tilt-zoom camera, and abrasive high-traction lift wheels. **518/399-2211; www.tvferret.com.**

IPS Introduces Test-Tite Pressure Relief Pneumatic Plug

The Test-Tite pressure relief pneumatic test plug from IPS Corp. features an internal-pressure, safety relief valve that reduces the risk of exceeding the proper inflation. If the recommended pressure is exceeded, the excess is released through the top of the plug, not the test area. Designed for testing or temporarily blocking plumbing DWV systems, the plug can be used in place of standard pneumatic test plugs. It features no moving parts, has a five-ring center seal and one-piece, injection-molded construction for strength and durability. Additional features include a crimped ferrule that attaches the relief valve to the test plug, ensuring it stays in place. **800/888-8312; www.ipscorp.com.**

Polylok Offers Poly-Cleanse Waste Digestant

Poly-Cleanse waste digestant from Polylok is a blend of bacteria designed to attack organic waste, including grease, toilet paper and soap scum buildup. The environmentally friendly digestant is available in liquid or powder and can be used in septic systems, cesspools, ATUs, drainfields, drains, grease traps, lift stations, sludge ponds and sewers. **888/765-9565; www.polylok.com.**

Coxreels Offers Wand Holder for 1125 Series

A wand holder has been added to the 1125 Series hand-crank and motorized reels from Coxreels. The aluminum holder has a black powder finish and measures 24 inches long with a 1.6-inch diameter. It can be mounted on all four reel locations, including the left, right, front and rear sides of the A-frame base. **800/269-7335; www.coxreels.com.**

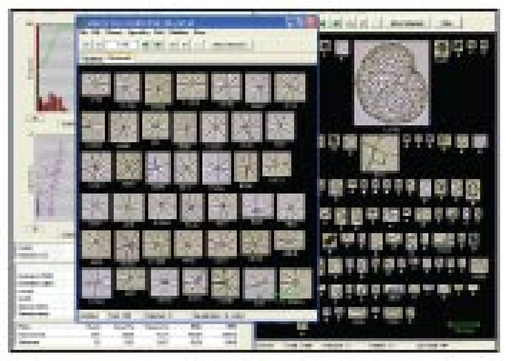
CUES Introduces LAMP II Inspection System

The self-propelled LAMP II inspection system from CUES Inc. is designed to perform pan-and-tilt inspections of mainline sewer lines while viewing and inspecting a lateral pipe. The system includes a self-propelled lateral launcher, transportation platform and two cameras — one for pan-tilt-optical zoom operations (mainline) and one for lateral launching. The LAMP II is available with a stainless steel or new fiberglass push cable. The fiberglass cable can inspect up to 120 feet into a lateral and the stainless steel cable can inspect up to 100 feet. Color video from the two cameras is displayed in a picture-in-picture format. **800/327-7791; www.cuesinc.com.**

Triple R Introduces Hydrostatic Test Pump

The HT-454 hydrostatic test pump from Triple R Specialty delivers up to 4.5 gpm and 400 psi. The pump comes in a protective steel case and includes 5-foot inlet hose with filter, 10-foot hp outlet hose with built-in check valve and pressure gauge. **800/356-9661; www.triplerspecialty.com.**

Fluid Imaging Introduces Image Analysis and Camera



FlowCAM instrumentation models from Fluid Imaging Technologies feature VisualSpreadsheet V2.4 particle image analysis software and high-resolution camera. Pre-loaded on the FlowCAM bench top, portable, submersible, V-1000 and Birefringent XPL models, the software and hardware combination increases FlowCAM's particle and microorganism imaging capabilities by 50 percent. **207/846-6100; www.fluidimaging.com.**

FCS Offers Drive-By Leak Detector Data Collection

The Patroller II wireless leak detector data collection system from Fluid Conservation Systems works with the FCS Permalog+ acoustic leak noise detector. The detectors attach magnetically to valves throughout a utility's distribution system and use algorithms to discern the acoustic signature of leaks from background noise. Once leak noise is detected, the Patroller II collects the data from a moving patrol vehicle. System software allows setup and operation from a single PC or laptop. Multiple loggers can be configured simultaneously. **800/531-5465; www.fluidconservation.com.**

SPX Introduces Clean Edge Impeller

The Clean Edge impeller from SPX Flow Technology's Lightnin Operation is designed for services that require a ragless impeller and is engineered to remain free of fibrous debris while delivering performance equal to a hydrofoil impeller. **585/527-1658; www.spxft.com.**

Control Microsystems Releases ClearSCADA 2010

ClearSCADA 2010 client-server enterprise software from Control Microsystems offers improvements for remote control and telemetry, enhanced connectivity to databases (SQLServer, Oracle, MySQL), improved security and enhanced alarm handling. To simplify access control and improve security management, the software offers Windows authentication for centralized management of passwords and disabled user accounts. **888/267-2232; www.controlmicrosystems.com.**

Ameron Offers T-Lock, T-Hab Sheet Lining System

The T-Lock PVC sheet lining system from Ameron Protective Linings Division is made to protect concrete sewer infrastructure from the damaging effects of hydrogen sulfide and other sewer gases. The T-Hab system uses T-Lock technology to rehabilitate 72-inch and larger diameter sewer tunnels. **936/321-1159; www.amerontlock.com.**

Envirosight Introduces QuickView 3.6 Zoom Survey Camera

The QuickView 3.6 zoom survey camera from Envirosight is designed to inspect 400 feet down line in pipes 6 to 60 inches in diameter. Featuring Haloptic illumination technology that reduces system power needs by 50 percent over previous models, the system has a built-in wide-angle camera that can inspect manholes and other close-up targets. A flip of a switch on the control box toggles between zoom and manhole modes. The camera head also tilts 180 degrees for greater viewing. **866/936-8476; www.envirosight.com.**

MWH Soft Introduces InfoWater Modeling Software

InfoWater Generation V8 hydraulic modeling software from MWH Soft is designed for ArcGIS 10. Built atop ArcGIS, InfoWater integrates advanced network modeling and optimization functionality with the latest generation of ArcGIS, enabling engineers to perform complex hydraulic analyses, including multi-point and extended period fire flow simulations, variable-speed pumps and advanced water quality calculations. **626/568-6868; www.mwhsoft.com.**

Reelcraft Introduces Twin Mobile Base Reel

The 9000 Series mobile base hose reel from Reelcraft Industries is made to accommodate longer lengths of twin hydraulic hose. Featuring a heavy gauge base, the reels are designed for truck-mount applications, but also can be floor, ceiling or wall mounted. **800/444-3134; www.reelcraft.com.**

Thermo Scientific Offers DataStick Measurement System

The AquaSensors DataStick measurement system from Thermo Scientific features pre-calibrated plug-in sensor heads that provide 24-bit data. It can be calibrated, configured or diagnosed directly from a PLC or computer system. No immediate analyzer boxes are needed. Measurement parameters include pH, ORP, conductivity, resistivity, free chlorine, dissolved oxygen, dissolved ozone, drinking water turbidity and suspended solids. DataStick supports Modbus, DeviceNet, Profibus, USB, RS232, RS485 communications and advanced Ethernet connectivity. **800/225-1480; www.thermo.com.**

Munsys Releases 10.3 Software

The Munsys 10.3 software from Munsys is designed with AutoCAD 2011, Oracle 11g Release 2 and Windows 7 compatibility. The program features infrastructure management, spatial data creation and editing. **800/696-1238; www.munsys.com.** ✦

WORTH NOTING

PEOPLE / AWARDS

Darrin Drollinger was named the executive director of the American Society of Agricultural and Biological Engineers, which also named award recipients for its student branches:

- Group A, Iowa State University
- Group B, University of Wisconsin

The American Water Works Association announced its award recipients:

- A.P. Black Award, R. Rhodes Trussell
- Archie E. Becher, Jr. Award, Greg Kail
- Distinguished Public Service Award, David Phillips
- Jack W. Hoffbuhr Award, Laurie Dougherty

Congressman Earl Pomeroy of North Dakota received the Friend of Rural Water Award from the National Rural Water Association.

Patrick Credeur of the Louisiana Rural Water Association has been named an advisory member of the Louisiana Municipal Association.

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

LEARNING OPPORTUNITIES

APWA

The American Public Works Association is offering an audio/Web broadcast of "Lessons Learned from Extreme Winter Events" on Oct. 7. Visit www.apwa.net.

CALENDAR

Oct. 12-15
WateReuse Symposium, Omni Shoreham Hotel, Washington, D.C. Visit www.awwa.org.

Oct. 17-20
National Conference on Water System Optimization, Hershey, Pa. Visit www.awwa.org.

Oct. 21-23
The American Society of Civil Engineers Annual Civil Engineering Conference, Las Vegas. Visit www.asce.org.

Oct. 26-28
The National Utility Contractors Association Safety Directors Forum, Las Vegas. Visit www.nuca.com.

Nov. 1-4
2010 Annual Water Resources Conference, Loews Philadelphia Hotel, Philadelphia. Visit www.awra.org.

Nov. 14-17
Green Streets & Highways Conference, Renaissance Denver Hotel, Denver. Visit www.asce.org.

Nov. 14-18
Water Quality Technology Conference and Expo, Savannah, Ga. Visit www.awwa.org.

March 2-5
Pumper & Cleaner Environmental Expo International, Louisville, Ky. Call 800/257-7222 or visit www.pumpershow.com.

AWWA

The American Water Works Association is offering the following courses:

- Sept. 29-Oct. 1 – Financial Management: Cost of Service Rate-Making, Denver
- Oct. 6 – Water Quality Management Within the Water Storage Tank Part 2, webcast
- Oct. 13 – Practical Asset Management, webcast
- Oct. 25-26 – Water and Health, Chapel Hill, N.C.

Visit www.awwa.org.

University of Wisconsin

The University of Wisconsin Department of Engineering-Professional Development is offering the following courses in Madison:

- Oct. 26-27 – Essentials of Hydraulics for Civil Engineers and Designers
- Nov. 15-16 – Advanced Steady Flow Modeling Using HEC-RAS L682
- Nov. 17-19 – Modeling Unsteady Flow Using HEC-RAS L683

Visit www.epdweb.engr.wisc.edu. ✦

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

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BLOWERS

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

BUSINESSES

Philadelphia/Allentown Pennsylvania Area Sewer Business For Sale. Specializing in collection systems, video inspection, jetting, municipal work. Includes CUES TV & grout truck, Sewer Equipment Corporation jetter truck, Vactor 2100, RIDGID camera, confined space equipment and more! Good revenue history. Great opportunity to expand or start your own business. Current owner wants to retire. **Offered at $330,000.** E-mail jeffb@colepublishing.com, visit www.BTwo.biz, or call 800-257-7222 and ask for Jeff Bruss for more details. **A B2 Business Brokerage Listing.** (MBM)

Looking to buy a business in the liquid waste, portable sanitation, or sewer & drain industries? Call B2 Business Brokers powered by Municipal Sewer & Water at 800-257-7222 and we can add you to our VIP buyer list. No obligation, no fees, no pressure. (MBM)

Green Bay Wisconsin Area Septic & Drain Business For Sale. Solid and steady revenue history and nearly 20 years established. Excellent opportunity to expand or start your own business. Includes very well-maintained 3,800 gallon septic service truck, fully outfitted 2002 Chevy drain service van, drain & sewer equipment, all office equipment and computers, 2,700+ customer list, and more - a true turn-key or easy expansion opportunity. Very meticulously maintained equipment all kept inside a heated shop. Current owner is retiring. Large shop and real estate is also available if desired at additional cost. **Offered at $249,000.** E-mail jeffb@colepublishing.com, or call 800-257-7222 and ask for Jeff Bruss for more details. **A B2 Business Brokerage Listing; www.BTwo.biz.** (MBM)

BUSINESSES

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Successful business with a large amount of equipment and inventory. Profitable sewer and septic business in central Pennsylvania. Increasing revenue over the past 3 years and a large amount of equipment and inventory. Equipment is a mix of old and new, but all is working and making money. Selling price $349,000. E-mail jeffb@colepublishing.com or call 800-257-7222 and ask for Jeff Bruss for more details. **A B2 Business Brokerage Listing - www.BTwo.biz.** (MBM)

North Carolina Septic and Installation Business for Sale. Showing good growth over the past 3 years. Includes all equipment to operate, extensive customer list, and owner is willing to train if necessary. **Asking $110,000.** E-mail jeffb@colepublishing.com, visit www.BTwo.biz, or call 800-257-7222 and ask for Jeff Bruss for more details. **A B2 Business Brokerage Listing.** (MBM)

Looking to sell your portable restroom business? We have buyers looking in the following areas; Florida, California, Virginia, Iowa, Kentucky, New York, Pennsylvania and more! Must have gross revenue in excess of $250,000 in most cases. E-mail jeffb@colepublishing.com, visit www.BTwo.biz, or call 800-257-7222 and ask for Jeff Bruss for more details. **A B2 Business Brokerage Listing.** (MBM)

BUSINESSES

Well-Established and Profitable Texas Septic, Sewer & Installation Business For Sale. PRICE RECENTLY REDUCED. Grossing in excess of $600,000 annually, customer list of nearly 2,000 accounts and 430 contracted customers. Includes nice late model equipment, most are 2007, 2008 model years. Owner retiring after nearly 40 years in business. Real estate available upon request. Reduced to $450,000. E-mail jeffb@colepublishing.com or call 800-257-7222 and ask for Jeff Bruss for more details. **A B2 Business Brokerage Listing - www.BTwo.biz.** (MBM)

Dallas/Fort Worth Texas Area Sewer/Rehab Business For Sale. Drain Cleaning, TV inspection, Pipeline & Manhole Rehab/ Relining, Municipal Cleaning and Maintenance business for sale. Excellent opportunity to expand or start your own business. Good revenue history and priced to sell. Includes all equipment to get started. **Offered at $150,000.** E-mail jeffb@colepublishing.com, visit www.Btwo.biz, or call 800-257-7222 and ask for Jeff Bruss for more details. **A B2 Business Brokerage Listing.** (MBM)

Looking to sell your industrial cleaning, hydroexcavation or waterblasting business? We have buyers. Must have gross revenue in excess of $1,000,000 annually. Nationwide interest. E-mail jeffb@colepublishing.com or call 800-257-7222 and ask for Jeff Bruss for more details. **A B2 Business Brokerage Listing.** (MBM)

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BUSINESSES

Very successful established Midwest based full service Trenchless Sewer Company with municipal and industrial experience and contacts available for acquisition. Serious confidential inquiries only. Please respond to P.O. Box 154283, Irving, TX 75015-4283 or email: cippcompany@yahoo.com. (CMBM)

Chicago-Area Biosolids, Land Application, Dredging and Industrial Services Business. Established in 1985, owner is retiring. Reputable business includes real estate servicing the entire Chicagoland area with sludge and biosolids disposal and treatment services. Real estate and shop included with sale valued at $750,000, business grosses in excess of $3 million annually, $6.3 million in equipment and assets including several TerraGators, Vac Trailers, dump trailers, loaders and much more. Offered at $4,900,000 - huge potential, good profit and priced right. Non-Disclosure Agreement required, all P&L statements, list of assets, and financials available to qualified buyers. E-mail jeffb@colepublishing.com or call 800-257-7222 and ask for Jeff Bruss for more details. **A B2 Business Brokerage Listing - www.BTwo.biz.** (MBM)

BUSINESS OPPORTUNITIES

Looking to sell your business? We can effectively market your business to more than 60,000 potential buyers in the liquid waste, portable sanitation, and sewer & drain industries, as well as your local markets, the Internet and other venues. No upfront fees — you don't pay unless your business sells. To learn more about brokering your business through B2 Business Brokers powered by Municipal Sewer & Water, call 800-257-7222. (MBM)

CATCH BASIN CLEANER

1997 Vac-All Catch Basin Cleaner, body only. 1997 E5-13D Vac-All catch basin cleaner, 13-yd. body, vibrator screen washer (roof of body), Paco water pump 75 psi, 120 gpm, 350-gallon water tank, Cummins 6BT 5.9 120 hp diesel engine. (Stock #010110-1) **www.VacuumSalesInc.com, (888) VAC-UNIT (822-8648).** (M10)

DEWATERING

FOR SALE: Envirex gravity belt thickener, 1.0 meter model S. New condition. 507-583-7308. (M11)

Xtreme Flow Cold Jetter - New! Model # CJ85-3600TU, tandem axle trailer, 35 HP Vanguard, 8.5 gpm @ 3,600 psi, 325 gal. water tank, 300' hose, General pump. List $19,995. **Sale only $14,995. Fully loaded!** 800-624-8186; www.hotjetusa.com. (MBM)

2006 GMC TC6500 cab and chassis with Pipe Hunter trunk mounted jetting unit, 3000 psi @ 50 gpm with a 1,000 US gal. water tank, rear mounted hose reel with JET EYE camera system. **6,800 original miles, new new. $129,000 sale price. (Retails for $210,000)** (Stock #13234V) **www.VacuumSalesInc.com, (888) VAC-UNIT (822-8648).** (M10)

PIPE REHABILITATION

Cues TV/Cutter Trailer: 2007 Evolution package, with or without camera, cutter or compressor. Call or go to our web site for photos and specs. www.mccannsunderground.com. Financing available. Kelly 608-279-2299. (MBM)

STRONG-SEAL Spraymate 35, 1994 manhole rehabilitation machine. New imron industrial paint, new tires, fresh tune up and oil change, Wisconsin V-4 engine upgraded to electronic ignition. Low hours, operates flawless. $19,750. Mike 815-790-2555; Erik 815-378-7401; trenchless@comcast.net. (C10)

MUNICIPAL SEWER & WATER

TRUCK STOP

see photos in COLOR at www.mswmag.com

2006 SECA Jet Vac 747 on 2004 Ford F650: 40 gpm @ 2000 psi, variable speed control, remote pendant, tiger tail, retrieve pay-out switch, level wind up/down, handgun w/25' hose, fin skid extension, manual clutch. (Stk. 1531)

Call Joe 312-706-9678 C10

2000 Camel: 1500 gal., 10-yd. debris body, rebuilt 80 gpm/2000 psi water pump, telescoping boom, PD blower, new 1" x 400' sewer hose. Unit mounted on 2000 IH 2654 6x4, DT530E, 275 hp, 14,943 miles, 1733 hrs. Ex-city unit.

Mike 800-294-0149 CO C10

2001 Sterling Vac-Con Combination Truck: 99,197 miles, 80 gpm @ 2500 psi, 3-stage fan unit, 1500 gallon water tank, 1" x 600' hose. $89,000

800-803-0332 C10

2000 IHC 2654: DT530, 275 hp, Allison auto., 46K rears, 20K front, A/C, double frame, Camel 200 jet vac w/PD blower, 1000 gal. water, 10-yd. debris tank, extendable boom. Only 28,258 miles.

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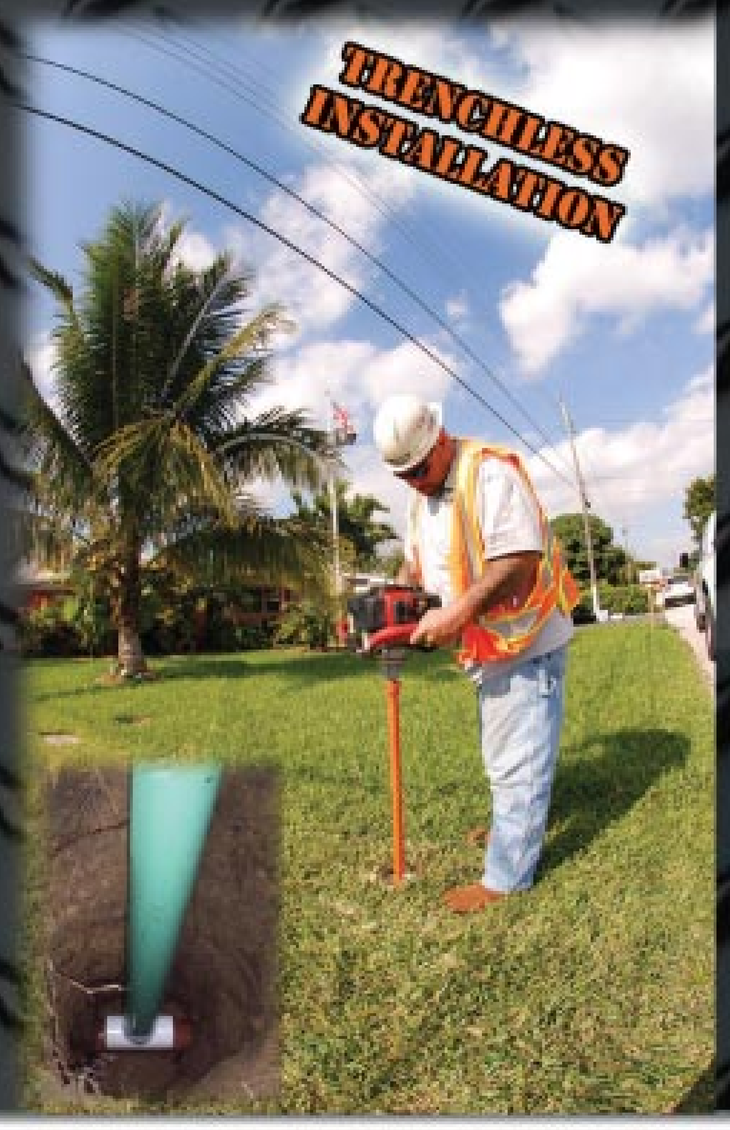

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