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**Mainline Sewer Inspection**

**MONEY MACHINES:** Maxi Miller solves multiple problems  
**SAFETY FIRST:** Monitoring job safety requires dedication  
**TECH PERSPECTIVE:** Tips for protecting your push cameras



### ON THE COVER

Nick Patrick established Sumner, Washington-based Trenchless Pipe Repairs in 2011 after more than a decade working for utility companies. Patrick's quick adoption of technology has played a significant role in the company's growth. (Photography by Stephen Brashear)

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Luke Laggis  
editor@cleaner.com

# The Threat Is Real

A quick shortcut, a simple lapse, and your whole world can change

By Luke Laggis

**S**afety isn't sexy. No one gets excited about gas monitors. But no one likes pulling dead bodies out of a sewer either.

I started out my June column with those words. I don't like repeating myself, but it's an important enough topic that it's worth saying again. And if they make even one person take a little extra time or put a little extra emphasis on safety, they could save a life. I can't think of any greater power a few simple words could hold.

Two of the stories in this month's issue of *Cleaner* relate to safety issues. The work you do can be dangerous, and at the end of the day, beyond getting the job done, beyond making a good profit, the safety of your crew should be top priority. If it's not, the end of the day — and someone's life — could come all too soon.

High-pressure water can cut you in half. Hydrogen sulfide can choke you out before you even know what's happening. Trenches can bury you alive. You probably don't face all these dangers on a daily basis, but you no doubt face at least one regularly. No matter how safety conscious you usually are, it only takes one lapse, one mistake, to change everything.

That's the thing about safety measures: They only keep you safe if you follow them 100 percent of the time. Accidents are often the result of little shortcuts, of failing to take simple steps to protect yourself to save a little time. The industry is filled with stories of people who tried to save a few minutes and ended up losing their lives. And if you push your employees to get jobs done faster than safe practices allow, there's a good chance you could lose your business, too.

The aforementioned gas monitors, along with other important confined-space gear, are critical if you're working in manholes, sewers, tanks or any other underground chambers. These aren't situations where you learn from your mistakes; they're situations where you die from your mistakes. That might seem overly dramatic if you're used to that kind of work and haven't had any issues, but do a quick internet search on "sewer fatality" if you want a quick and sobering reminder — page after page of people who didn't take the proper precautions and paid the ultimate price.

This month's Safety First column takes a look at confined-space safety and the dangers of hydrogen sulfide. You probably know that the gas has the distinct smell of rotten eggs, an obvious warning sign. But as it reaches higher concentrations, H<sub>2</sub>S paralyzes the olfactory nerve. You won't smell it. You'll just collapse and die. Please take the time to read the column. Even if you're familiar with all the information, the reminder is worthwhile.

High-pressure water is another threat altogether. The pressures used for industrial cleaning require the highest level of safety. The management team at PSC Industrial Services in Houston, Texas, is well aware of the threat and has invested heavily to keep their people safe.

The company has spent \$4 million to get its operators out of harm's way and into the protected, climate-controlled cabs of its automated tube-lancing systems. In addition to boosting efficiency, the company has gone the extra mile to keep its people safe.

I hope you'll do the same.

Stay safe, and enjoy this month's issue. **C**



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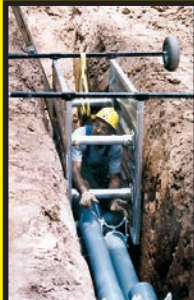


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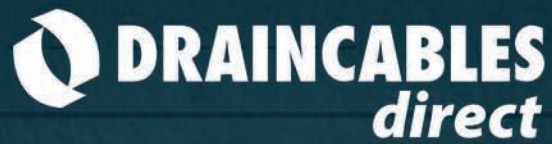
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# Out of the Line of Fire

Automated tube-lancing systems remove employees from harm's way and enhance customer service during time-critical plant shutdowns

By Ken Wysocky

Employee safety is a paramount concern at PSC Industrial Services. In recent years, officials at the Houston-based firm have taken an even more stringent approach to worker safety by investing more than \$4 million in ATL-5000 and ATL-5015 automated tube-cleaning systems, made by NLB Corp.

Hydroblasting is a highly effective way to clean industrial equipment, but it is an inherently high-risk activity. "A lot of bad things can happen," says Brad Clark, chief executive officer for PSC, a provider of specialty maintenance services to the energy industry, employing 3,000 people and serving customers throughout the U.S. "The safety of our workers is more important than any activity, and it is incumbent on PSC leadership to ensure that our team is equipped with the safest and most modern equipment in the industry."

The NLB units are used to clean heat exchangers, which consist of bundles of metal tubes that help things such as chemicals, water, gases and other materials flowing at safe operating temperatures as they're processed at petrochemical plants and refineries. A heat exchanger bundle might include anywhere from a few hundred to thousands of tubes, typically 3/4 inch in diameter and 20 to 25 feet long, Clark says.

To run an ATL-5015, an employee sits roughly 10 feet off the ground in a climate-controlled cab, totally removed from the operation of lances that inject streams of water at pressure up to 20,000 psi and flow as high as 20 gpm. The cab's elevation also maximizes the field of view for operators, further enhancing safety.

"Everything is joystick-controlled," Clark says. "With automated equipment, the operator is moved well away from the line of fire. With the continued development of new technologies, nearly all manual approaches can be replaced with automated means, where the operator works from a safe distance. Safety is such a critical piece of what we do and we are therefore committed to removing workers from harm's way by performing all industrial hydroblasting using state-of-the-art automated equipment and technology."



The automated tube-cleaning systems made by NLB Corp. place operators roughly 10 feet off the ground in climate-controlled cabs, totally removed from the operation of lances that inject water at up to 20,000 psi and 20 gpm.

## money machines

**OWNER:** PSC Industrial Services, Houston, Texas

**MACHINES:** ATL-5000 and ATL-5015 automated tube-cleaning systems from NLB Corp.

**FUNCTION:** Cleaning heat exchangers in refineries and petrochemical plants

**FEATURES:** Elevated, climate-controlled operating cab; five simultaneously operating automated lances; adjustable stroke length, up to 30 feet; lance speed of 39 inches per second; lance heights ranging from 24 to 83 1/2 inches; maximum water pressure of 20,000 psi/40 gpm; maximum cleaning width of 59 inches; no external power supply required

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**COST:** About \$500,000

The units feature five hydraulically powered lances that can be programmed for different "stroke" lengths, depending on how long the tubes are, and for different speeds. The speed at which the lances penetrate the tubes is critical; if it's too fast, cleaning isn't as effective, and if it's too slow, the high-pressure water stream can damage the tubes.

"There's a fine line between cleaning well and damaging or degrading the tubes," Clark explains. "If you leave a lance in one place too long, a



20,000 psi water jet can cut through metal. As such, we strive to get a very consistent, quality clean from the first tube to the last.”

In addition, a properly cleaned tube is paramount for the process of nondestructive testing, which inspects for deterioration and degradation of the metal tubes, he adds. Moreover, properly cleaning is critical to maximizing the heat-transfer abilities of the tubes, which in turn optimizes plants’ operating efficiencies. A good comparison is a car radiator, which works more effectively when clean, Clark points out.

Cleaning the tubes is a tough task. In refineries, for example, some processes leave behind crude deposits — a heavy, tar-like material. When refineries shut down for planned maintenance, the deposit cools and becomes almost asphalt-like in consistency. “It’s quite hard and can be very sticky and messy,” he notes. “Sometimes the tubes are half clogged or even totally clogged. It’s very difficult to remove.”

The fact that the ATL-5000s and -5015s have five lances makes them roughly five times more productive than the manually operated single-lance machines PSC used in the past. More importantly, operators are comfortable and out of harm’s way, which makes it easier to recruit quality employees.

“Hydroblasting (manually) at a refinery is not a fun activity to do out in the weather,” Clark explains. “But with the ATLS, now you’re sitting in a climate-controlled cab, out of the weather. Plus, you’re using a piece of sophisticated equipment ... you’re using your brain, not your back. And you don’t feel like you were riding a bull all day, which is what it felt like if you were doing it by hand.”

The ATLS have also proven to be durable and reliable, which are critical factors during plant shutdown, where every minute counts. At a typical plant, there might be hundreds of bundles to clean, inspect and put back in service as quickly as possible — without compromising quality. The last thing a customer wants is tubes that must be cleaned twice in order to pass inspection.

“Plant turnarounds are very complex logistical operations, with several moving parts and when things get interrupted, it’s bad,” Clark says.

NLB is more than just an equipment supplier to PSC, he adds. The manufacturer is also a strategic business partner and valuable resource that provides great engineering and technical support, and reacts to feedback on issues such as employee safety. In fact, the ATL-5015 — the next-generation version of the ATL-5000, features innovations that resulted from collaboration between PSC and NLB, he says.

“They’re very important tools for our company and are highly valued by our customers,” Clark says. “They provide a very solid return on investment — which is why we’ve bought 15 of them — and will continue to do so. Moreover, they’re a pivotal part of our overall strategy to remove workers from harm’s way with automated equipment.”



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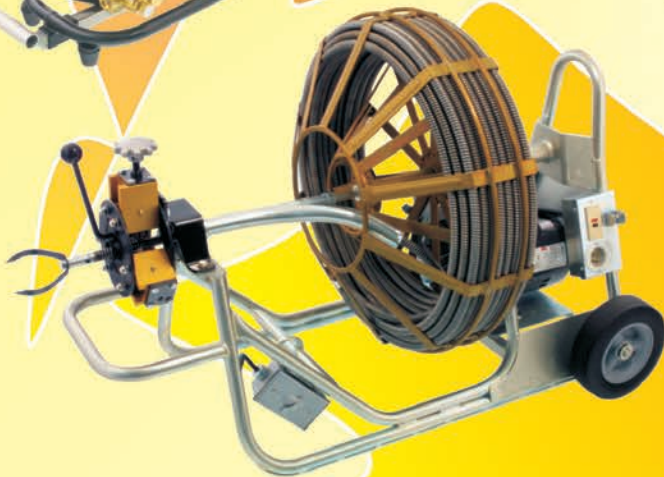
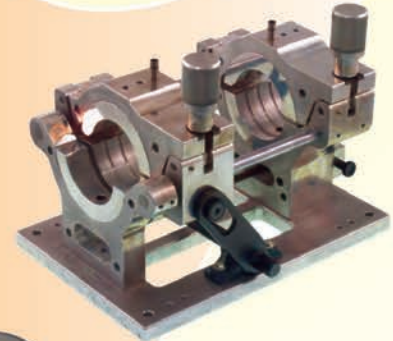
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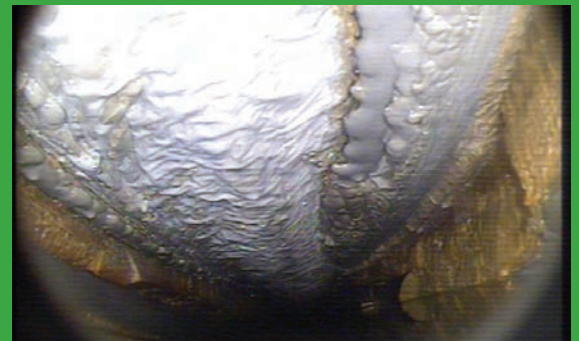
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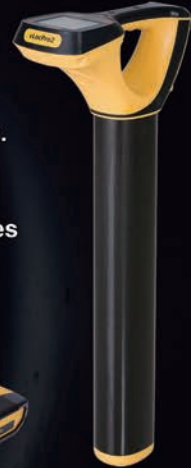


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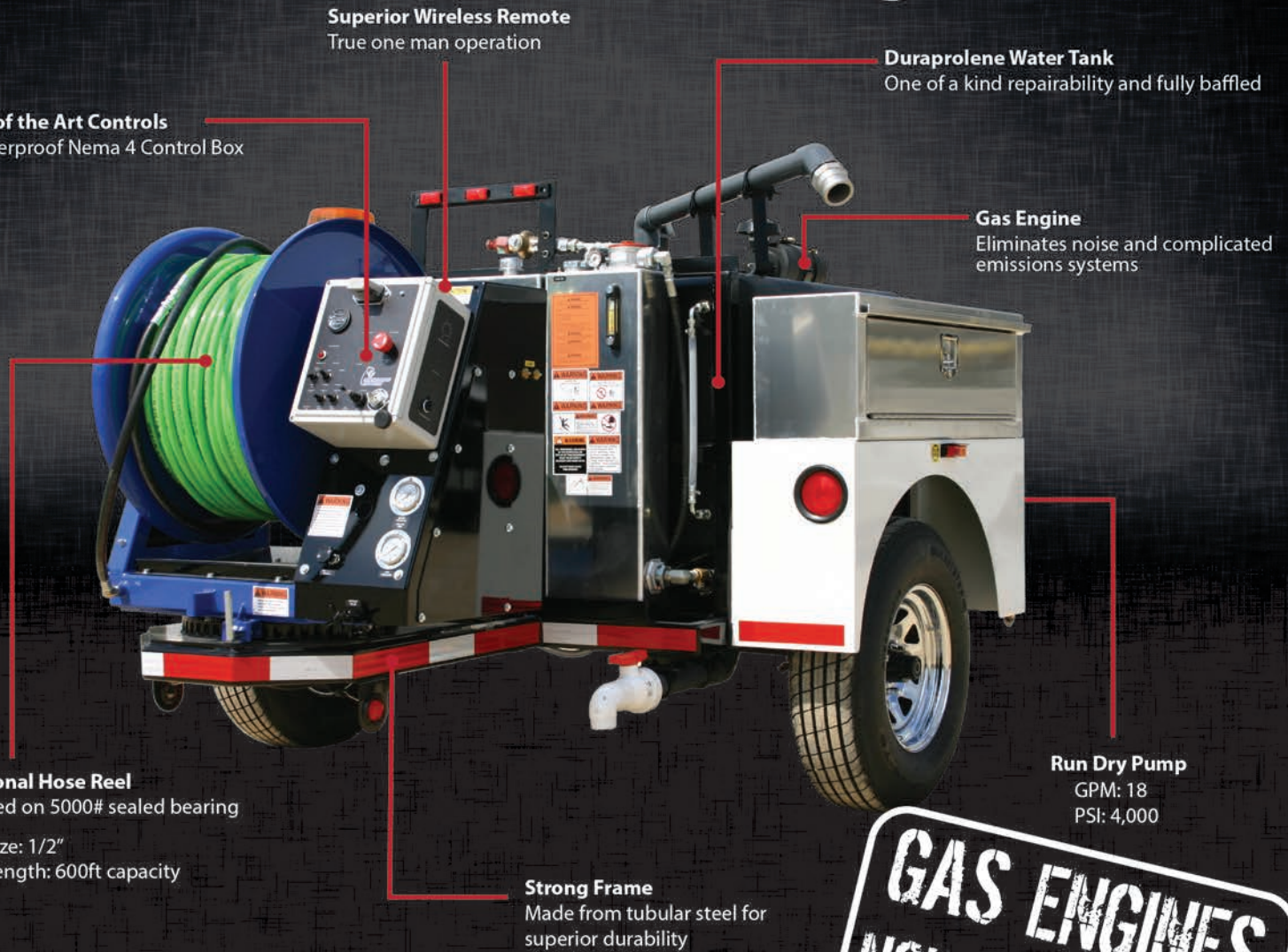
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# A TARGETED APPROACH

TRENCHLESS PIPE REPAIRS TOOK AIM ON THE RESIDENTIAL MARKET AND THEN MOVED STRATEGICALLY INTO MUNICIPAL AND INDUSTRIAL WORK

The team at Sumner, Washington-based Trenchless Pipe Repairs includes (from left) James Tryon, Mike Wasmund, owner Nick Patrick and Eric Poteet.

BY KEN WYSOCKY PHOTOGRAPHY BY STEPHEN BRASHEAR

There are several reasons why Trenchless Pipe Repairs has emerged as a major player in the Pacific Northwest's pipeline inspection and rehabilitation market. But one factor looms a little larger than the others: Owner Nick Patrick's keen interest in productivity- and profit-enhancing equipment.

"I'm a technology junkie," says Patrick, 44, who established TPR in 2011 after working for more than a decade for two utility service companies. "I'm always researching new products that will allow us to expand services.

"Everything I do is calculated," he adds. "We don't buy equipment unless we're sure we can use it and pay it off. Nowadays in this industry, new products are coming out left and right. You just have to figure out what's good and what's not."

Other factors have also figured heavily in the company's success, including a slow but strategic conversion from mostly residential work to large commercial and municipal projects, heavy use of social media to build TPR's brand recognition, and specializing in tackling the more-difficult jobs — a niche that commands better profit margins. "We've basically separated ourselves as a specialty contractor," he says.

"I pay attention to small details," he says when asked about his most valuable attribute as a businessman. "I'm also very driven. When I start something new, I always strive to be the best at it."

The results speak for themselves. Patrick generated about \$247,000 in gross revenue during his first year in business, employed one person, owned only a 2007 Ram pickup truck and a 1995 GMC box van, and served just the local residential market. Today, Patrick employs eight people, owns roughly \$1 million worth of equipment and vehicles, and expects to gross about \$2.2 million this year serving customers throughout Washington and Oregon.

## profile

### TRENCHLESS PIPE REPAIRS LLC

SUMNER, WASHINGTON

FOUNDED: 2011

OWNER: Nick Patrick

EMPLOYEES: Eight

SPECIALTIES: Trenchless pipe rehabilitation, drainline/sewer cleaning and inspection

SERVICE AREA: Washington and Oregon

WEBSITE: [www.trenchlesspiperepairs.com](http://www.trenchlesspiperepairs.com)



Mike Wasmund (left) and James Tryon of Trenchless Pipe Repairs use a camera to check a sewer line after a CIPP repair.



# SOCIAL MEDIA HELPS BUILD A BRAND

Nick Patrick — the owner of Trenchless Pipe Repairs in Sumner, Washington, uses social media to give potential customers a vivid look at his company's high-tech capabilities. He believes it showcases his services much more effectively than a website.

To Patrick, 44, websites are fine for disseminating technical information. But they don't even come close to showing customers what his company is all about, compared to the photos and videos he regularly posts on Facebook, YouTube, Twitter and LinkedIn.

"You can look at different websites and they all pretty much look the same — mainly just a bunch of words," Patrick explains. "But with social media, you can post pictures and tell little stories about what you're doing.

"We still use our website as a place for customers to get technical information," he continues. "But for marketing, it's all about social media. People can see the actual jobs you're doing and the equipment you're using, and it's all in real time. They learn more about your company that way than via our website. That's why I've blown up my company on social media."

Patrick estimates that social media generates up to 30 percent of his company's job leads. And best of all, most social media platforms don't cost a penny. One exception is a premium membership package from LinkedIn that costs \$550 a year. But even that expense is worthwhile; Patrick says he's ranked among the top 10 percent of contractors in the pipe lining industry on LinkedIn. And LinkedIn has led to connections with people all over the world.

"Engineers and municipal officials can see everything we do," he says, explaining the value of social media. "There's an immediacy to it because you can post things right away in real time. You can't really flood a website with photos, but you can flood social media with photos.

"Then they talk to somebody about what they saw," he continues. "And then those people, in turn, talk to even more people about it. ... In our case, this company in Seattle that has a robot that can cut obstructions from sewer lines."

While it's great that potential customers can see that TPR uses cutting-edge technology to serve its customers, doesn't that also provide valuable intel for competitors? "Yes, it shows them what I'm doing," Patrick concedes. "But there's nothing I can do to stop that. I'm more concerned about marketing what we do because that's what helps build our reputation."

There's no need to feel daunted about using social media, either; Patrick says he's completely self-taught. And he has his field technicians trained well, too. If Patrick can't get to a job site, his technicians take photos and text them to his cellphone. From there, he posts them right away on social-media platforms. "People love to see the cool things we're doing."



## UTILITIES 101

Patrick began his career in 1995 when he took a job with a utility-locating and -marking company in Seattle. In 2000, he gained more experience by transferring to a sister company that offered pipeline inspection services and lateral lining. In 2009, he expanded his knowledge by partnering with another contractor to start a cured-in-place pipe lining business that focused on sectional, lateral and lateral-connection lining. Two years later, the duo dissolved the partnership and Patrick established TPR, focusing primarily on lining residential sewer laterals.

Patrick purposely targeted the residential market. Reason 1: He was able to establish business relationships with plumbers who hired him as a subcontractor. Reason 2: a little thing called cash flow.

"Cash flow is extremely important when you're starting out small with nothing," he points out. "It's always a problem if you have a huge capital investment (in pipe lining equipment), which I did. Getting paid up front allowed me to pay for things as I went along and slowly expand the business. By getting money up front, I could still make the payments on my equipment, but also throw additional money into marketing."

After Patrick established the company in the marketplace, he moved into the industrial and municipal markets. While he concedes it takes longer to get paid in those sectors, there's upside, too: better profit margins.

## GAME-CHANGER

Today, about 75 percent of TPR's revenue comes from relining. The company uses a Perma-Liner Maverick system that relies on hot-water



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Nick Patrick



<< James Tryon controls air pressure at the Perma-Liner inversion unit while Mike Wasmund and Eric Poteet install a CIPP liner in a municipal sewer line.

>> Mike Wasmund (left) and Eric Poteet attach a water line to the inversion head on a lining project.



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curing technology. Drain cleaning and inspection generates the remaining 25 percent. But a new market — robotic cutting service for removing drainline obstructions — is slowly transforming his company once again.

This emerging sector graphically illustrates the value of investing in new technology in order to attack a new market niche. In this case, a construction boom in Seattle and the Pacific Northwest is driving demand for the service. As contractors frame up foundations for large buildings, they also periodically drive in tieback anchors to more firmly affix the foundations to the ground.

“While they’re drilling, they’re hitting sewers and filling them with grout that’s used to anchor the tiebacks,” Patrick explains. The solution? A Schwalm Robotic Talpa FSR 2060 that can remove grout and concrete from sewer lines with a retrofitted 3,000 psi water jet that doesn’t damage the mains. Moreover, the unit includes a video camera that allows the operator to watch the robot at work.

The Schwalm unit is housed in a camera truck, built on a GMC Kodiak chassis with an 18-foot van body. The truck also carries an Aries pipeline inspection system.



**ABOVE** Mike Wasmund pours resin into a liner held by James Tryon in preparation for a CIPP repair.

**BELOW** Tryon, Wasmund and Poteet (from left) feed a liner through the roller to impregnate it with resin prior to installation.



TPR also owns a 16-foot 2017 Isuzu lateral-lining van built by Perma-Liner Industries; a 14-foot 1995 GMC sectional- and connection-sealing van outfitted with equipment from Perma-Liner, Source One Environmental and Interfit USA; and a 2016 Ram 3500 that carries more Perma-Liner equipment.

In addition to the Schwalm unit, the company owns a Maxi Miller cable machine, made by Picote Solutions for cleaning 4- to 8-inch-diameter pipes; a trailer-mounted water jetter built by Jetters Northwest (a division of Seattle Pump & Equipment) that can clean 2- to 6-inch-diameter lines (12 gpm at 3,000 psi); a 2015 Dodge ProMaster equipped with an Enviro-sight Rovver X Verisight Pro cameras, also made by Enviro-sight; a RIDGID NaviTrack pipeline locator; and a lateral reinstatement cutter made by IMS Robotics GmbH.

## KEYS TO GROWTH

Using advanced technology isn't the only reason for TPR's growth. Patrick also credits innovative marketing, such as the two-day-long open houses he holds for municipal officials, general contractors and engineers. The main events: Live demonstrations of TPR's latest investments in technology at work, such as the Schwalm Robotic unit.

"They basically get to see all the equipment we have and what we can do with it," he says. "I've been holding these open houses since day one and we try to do two or three a year." All the demonstrations are performed

"I LOVE BEING A SMALLER, FAMILY-RUN COMPANY. BUT THE BIGGER YOU GET, THE MORE DIFFICULT THAT IS TO MAINTAIN. SO I'D LIKE TO KEEP THINGS SMALLER."

Nick Patrick

above ground with sewer line mockups and each one is preceded by a brief PowerPoint presentation.

Patrick concedes that two days is a lot of time to invest. But he points out that it's easier to have a group of people come to his facility for demonstrations than it is to make separate visits to each person who attends — typically about two dozen people. Including a luncheon that Patrick holds on both days, the time commitment for customers comes to about five hours a day.

Creating a family atmosphere for employees also yields benefits. "We treat everyone like family, not just a number," Patrick notes. "When you



Eric Poteet feeds a liner into the inversion tube for installation.

treat employees like family, they're more interested in the company and take more pride in what they do. They realize that we're not only trying to grow the company, but also trying to give them the kinds of technology that allow them to grow as people — build a career."

Looking ahead, Patrick anticipates more growth but never wants to grow so much that he needs more than 20 employees. At that size, he'd start to worry about quality control and losing the friendly, family-like environment he's created over the past six years.

"I love being a smaller, family-run company," he says. "But the bigger you get, the more difficult that is to maintain. So I'd like to keep things smaller.

"Three to five years down the road, I'd love to be able to sit here and basically have the company run without me. But on the other hand, you never know where things will lead." c

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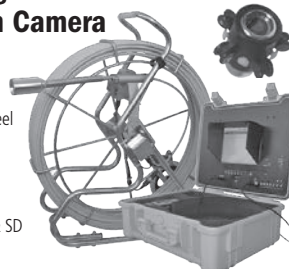
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# Treat 'Em Right

Respect your customers' time, deliver on your promises, and be up front with your fees

By Kate Zabriskie

There are valuable lessons to be learned from service snafus across all industries, whether you clean drains or work in transportation. Case in point: It's Any Airport, U.S., at 2 a.m., and someone makes the announcement that the delayed 6 p.m. flight will finally begin boarding.

In a super-perky voice, the gate agent then welcomes the titanium, topaz and Teflon flyers and makes a big deal about them standing to the right of the rest of the crowd so that they may cross over a red bathmat before showing their boarding passes.

Once that collection of special status holders is taken care of, the agent starts loading passengers by boarding group and ceremoniously blocks off access to the all-important 2- by 4-foot carpet square.

As she checks boarding passes, she half-heartedly asks people to stow their smaller items under the seat to leave room for larger bags in the overhead bins.

Onboard, the flight attendants don't seem to care too much about bags either. Consequently, plenty of coats and small items fill the only storage area that can accommodate a suitcase.

It doesn't take a mind reader to know what happens next. There's no room left, and the remaining passengers have just had another 40 minutes or so added to an already miserable excursion. Thanks airline! With a modicum of effort, everyone's bag could have fit, but not tonight.

While great customers certainly deserve an organization's appreciation, in this instance, the airline's focus should have been on accommodating all customers' carry-ons.

By wasting people's time, the airline managed to make the skies and the ground anything but friendly. Oddly, the company will spend millions on marketing in an attempt to build relationships with those same customers.

For a company to have anything but a dysfunctional relationship with its customers, however, it must show them respect. Without it, the rest means nothing.

At the heart of disrespectful service are three errors: Taking actions that charge customers money they don't expect to spend, costing customers time they don't have to give, and failing to deliver on promises.

## BE TRANSPARENT

If you've ever made a reservation at a hotel with a plan of arriving late, sleeping, and checking out first thing, you're like many business travelers. If you've also had that in-and-out plan along with the experience of unexpectedly encountering a property with a hefty resort fee charged to all guests regardless of use, you know what it is like to part with money and not feel good about it — even if that money isn't yours.

While there's nothing intrinsically wrong with having a resort fee, what is wrong is leaving off the total when the reservation is booked. It's dishonest. If the fee isn't optional, it is part of the cost of the room and should be listed as such.

Be transparent with your fees. Customers have a right to know what things cost. When they don't, they don't like you very much.

When certain fees depend on what you encounter, be up front in the beginning. Better still, offer a range. If clearing your lateral line is *relatively straightforward, you're looking at \$150 dollars. On the other hand, if we find extensive root intrusion or pipe damage, you can expect costs to go up substantially. Worst case, you're looking at \$150 + \$X.*

Think about how you communicate money to your customers. Do you do all you can to make costs easy to understand?

## VALUE THEIR TIME

If you've ever been to a well-run theme park on a busy day, you've witnessed staff who are exceptional at safely moving huge numbers of people through the gates, on and off rides, and in and out of restaurants. Sure, the lines are long, but nobody is waiting one second longer than absolutely necessary.

If you're working in a venue where long lines exist and guests can see obvious inefficiencies, watch out. The most tolerant bunch of people will transform into loud and impatient customers who channel annoyance into intense anger right before your eyes.

Nobody enjoys having their time wasted. Great service providers walk in their customers' shoes. They see the customer experience through the customer's eyes. They know that it's important for staff to be responsive and do what they can to avoid wasting a customer's time.

Look at your customers' interactions with you. Are there places where inefficiencies exist that could be eliminated without sacrificing safety or something else your organization values? If so, show your customers some respect by becoming more efficient. If you are not sure where you could make improvements, ask your customers. They probably know. And if you've ever kept them waiting for a service call, they've certainly had enough time to think about it.

## DELIVER ON PROMISES

Companies that fail to deliver on their promises erode customer trust. Don't believe it? Think about toy commercials from your childhood. How about the one that showed a toy doing something amazing, and caused you to develop an obsession. You wanted it. You told everyone. It was on the top of your wish list. Then, finally someone finally bought it for you.

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Weren't you a little disappointed when it didn't behave as advertised? It didn't fly or drive on its own. You felt crushed, and misled. Your customers experience those same emotions when you don't come through, and guess what? They don't like you very much when you fail to deliver.

Take an inventory of your promises. Where are you living up to your word, and where are you falling down? Start fixing those areas that are bound to cause disappointment.

## SHOW RESPECT

Being opaque about costs, making customers wait, and failing to deliver on promises all indicate disrespect. Each of those actions shows people you don't value them, and you don't think they are worthy of receiving better treatment.

If you ever treat customers that way, don't be surprised if they call someone else the next time their drains back up. **c**

## ABOUT THE AUTHOR

Kate Zabriskie is the president of Business Training Works Inc., a Maryland-based talent development firm.



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PROFILE



# GIVING THE CUSTOMERS MORE

EXPANSION INTO PIPE BURSTING AND MANHOLE REHAB OPENS MAJOR REVENUE STREAMS FOR PLUMBING AND DRAIN CLEANING COMPANY

BY SARAH UMHOEFER  
PHOTOGRAPHY BY MARK HIRSCH





## Jeff Crigger's career experience is diverse, and so are the services he provides.

Dependable Drain & Plumbing was initially a one-man operation with a slim equipment inventory, specializing in drain cleaning, sewer repair and plumbing. Today, its team of 15 also provides pipe bursting, manhole rehabilitation and catch basin service, repair and replacement, with a customer base that stretches across three states.

This diversification of services directly correlates with the Clinton, Iowa-based company's success: It has grown at least 10 percent each year, with record growth last year.

"We grew all of 23 percent last year. It's huge," Crigger says. "Now we're trying to figure out our game plan and financials for this year, which is key. My wife, our office manager and our accountant play a big role in this now. When we first started, we didn't have to worry about this stuff beyond paying taxes.

Now it's a whole new ball game. I learn a lot every day. There have been many sleepless nights — believe me — in trying to figure this out. If it wasn't for our support staff, I'd be in a lot of trouble."

### GETTING STARTED

Crigger got started in the industry in 1987 when he moved from his hometown of Clinton, Iowa, to Colorado, where he worked for a plumbing and drain cleaning company for 10 years. He went through the ranks as a service tech, supervisor, lead supervisor, safety supervisor and assistant manager. "I missed running service though, so I went back as the lead supervisor," he says.

From Colorado he moved to Florida, but after just a year in the Sunshine State, he knew it was time to head home. "It was just too hot for me. At Christmas time, it was 75 degrees, and I didn't like that. So I came back to Iowa and worked for Roto-Rooter for 2 1/2 years.

### profile

## DEPENDABLE DRAIN & PLUMBING

CLINTON, IOWA

**OWNER:** Jeff Crigger

**ESTABLISHED:** 2000

**EMPLOYEES:** 15

**SPECIALTIES:** Drain cleaning, sewer repair, plumbing, pipe bursting, manhole rehabilitation, catch basin service

**SERVICE AREA:** Illinois, Iowa and Missouri

**WEBSITE:** [www.dependabledrainandplumbing.net](http://www.dependabledrainandplumbing.net)



**ABOVE** The team at Dependable Drain & Plumbing in Clinton, Iowa, includes (front, from left) Joe Hughes, Troy Crigger, Shane Foltz, Vince Jackson, and Nick Mangusing; Back: Ted Dann, Tony Cozzolino, Jim Vilmont, Adam Otto, Lonny Melchiori, Jess Snyder, Jeff Crigger, Tracie Crigger and Mario Betties.

**>>** Ted Dann loads Permacast MS-10,000 manhole liner into the mixing hopper to feed the Permaform Bi-Directional Spin Caster that sprays the liner onto the manhole interior.



“Starting my own company wasn’t even a thought when I came back to Clinton. But then my wife said, ‘You know so many people here. Why don’t you give it a shot?’ I was head over heels and thought it was a great idea. The very first day when I started my company, I remember sitting there at my house thinking, ‘I don’t have a job. I don’t have a truck. I don’t have equipment. What the heck did I get myself into?’”

Instead of poaching customers from local plumbing companies, Crigger approached them with a proposal: He would do drain cleaning contract work and direct any plumbing-related questions and work back to the contractor. “I told all the plumbers I approached that while I am on a drain cleaning call, if a customer wants me to do something, I’ll tell them to call you.”

The approach helped push the young company forward. “For my very first job I had to borrow my dad’s truck

CONTINUED >>

<< Nick Mangusing (left) helps Mario Betties with the Bi-Directional Spin Caster while applying Permacast MS-10,000 manhole liner.

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# GREAT EMPLOYEES MAKE IT WORK

Jeff Crigger, owner of Dependable Drain & Plumbing, makes sure to give credit where credit is due.

"I can't say enough about my employees," he says. "They always go above and beyond."

While Crigger is more than capable of covering the plumbing and drain cleaning side of the business, manager Troy Crigger takes it to a new level. "Troy has taken it a step further because people request him all the time. We always laugh that it's too bad we can't clone another Troy."

Even when Jeff Crigger is available to take a plumbing call, customers still ask to work with Troy because they "just like the guy."

"I've never seen him lose his cool, either," the boss says. "He can get into some of the gnarliest, toughest drain cleaning jobs in the world, and he'll think it through, figure it out, get it done and move on."

Dependable Maintenance Systems — Crigger's second company that does manhole rehabilitation — is managed by Ted Dann. Crigger brought Dann to the WWETT Show to look at manhole rehab equipment, and Dann ended up being a natural fit to oversee the service. "Ted was giving me some really good insight, and I thought, 'Well geez, this guy seems to care.' And now he's just turned into a rock star," Crigger says.

"The engineers call for him, and the guys respect him. Ted's a super guy, he works hard, and he takes care of the DMS side of things. He picked up on how to use epoxy, on how to use the spin trailer, he troubleshoots problems, and he calls to fill me in on how their day goes."

When it comes to the concrete-associated work and catch basin rehab in the local area around Clinton, Iowa, manager Tony Cozzolino has that branch of DMS covered. "Tony manages that whole crew. If there are any issues, he doesn't call me — he'll just take care of it," Crigger says. "He deals with the city engineers, he deals with the local utility companies, he gets parts and materials.

"I can run a trowel, but for the most part if I'm trying to trowel something with these guys, they'll take the trowel out of my hands and give me the look, and I'll say, 'I'll go back in the office, I guess,'" Crigger laughs.

While Dann, Troy Crigger and Cozzolino keep things running smoothly on job sites, office manager Jess Snyder is "the glue that keeps us together. She cares about this company, and it impresses the heck out of me. When it comes to office managers, I would have a hard time believing there's anybody better out there."

That caring personality enhances the customer service Dependable Drain & Plumbing provides. "She'll calm down customers and reassure them — I've seen it firsthand," Crigger says. "And she's such a people person that sometimes I'll walk into the office and she's talking to a customer, and the next thing you know she's talking about baking a cake or something like that with them.

"Again, these key players in my company have made a huge difference. I don't know what I'd do without them."



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**BELOW** Nick Mangusing finishes troweling on Permacast liner material in a manhole in Clinton, Iowa.

**RIGHT** Ted Dann (left) and Mario Betties monitor progress and safety from above as Nick Mangusing works in the manhole below.



“THE VERY FIRST DAY WHEN I STARTED MY COMPANY, I REMEMBER SITTING THERE AT MY HOUSE THINKING, ‘I DON’T HAVE A JOB. I DON’T HAVE A TRUCK. I DON’T HAVE EQUIPMENT.

**WHAT THE HECK DID I GET MYSELF INTO?”**

Jeff Crigger

and a sewer machine from another contractor until my equipment got here. At that time, my ad in the Yellow Pages didn’t come out for another six months, so all the work I was doing was from word-of-mouth, and I hand-delivered 10,000 fliers. It was a lot of footwork.”

It didn’t take long for Crigger to realize he needed to take on some help. “At that point about six months in, some days I’d be replacing a sewer line, and I’d hire some friends I knew that had an excavation company to dig for me. I would lay the sewer, and as soon as it was bedded and the first layer of dirt on it, I would start taking calls,” he says. “That turned into 9, 10 o’clock nights real quick. . . . All my other jobs before owning my own company were commission-based, so I was used to working sun-up to sun-down and then some, but I just couldn’t get to everybody.”

Help came unexpectedly. “One day I was sitting there on a job, and as I walked out to my truck these two young guys were standing there, and one of them said, ‘We’ve been in the park across the street watching you. Do you need a hand? . . . My dad owns a drain cleaning company in the Quad Cities, and I know how to clean drains.’”

Both of the impromptu part-time employees helped out for a summer or two. Crigger’s first full-time employee was his nephew, Troy Crigger, who’s been with the company now for almost 16 years and manages the plumbing division.

### **SERVICE PROGRESSION**

Dependable Drain & Plumbing has steadily diversified its services over the years, starting in 2001 when Crigger read about pipe bursting in *Cleaner*. “I started looking into it and said, ‘Are you kidding me? We don’t have to dig a 100-foot-long trench? We only have to dig two holes?’ It was a win-win situation for us: not as labor-intensive, and it wouldn’t look like a bomb went off in the customer’s yard.”

In September 2001, Crigger purchased a TRIC pipe bursting system, along with a SeeSnake camera, K7500 and K3800 drain cleaning machines and a locator, all from RIDGID.

Pipe bursting was an instant success for the company. “It took off. That was so in demand that we would do a residential home in a neighborhood, and we wouldn’t leave for three weeks because the neighbors would come over and ask us to do theirs.

“From there, we just kept building — doing sewer lines, waterlines, service and repair plumbing — and then in 2009 we started doing concrete-associated work for municipalities.”

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➤➤➤ Nick Mangusing uses a remote switch to control the spin caster on a manhole rehab project in Clinton, Iowa.

Repairing and replacing catch basins paved the way for a new service — manhole rehabilitation — and a whole new business: Dependable Maintenance Systems. “At that point in 2010, I was looking to diversify and we were looking into porta-potties, we were looking at a jetting service, and we were looking into directional boring. And then I stumbled across manhole rehab.”

Crigger brought his son, Nate; his cousin, Ted Dann; and Dependable Drain & Plumbing’s plumbing manager, Troy Crigger, to the WWETT Show in 2010 to learn more about the process. They decided to make the investment in a Permaform Bi-Directional Spin Caster and a Parson Mortarman 120 Plus Mixer, and thus Dependable Maintenance Systems (DMS) was created.

“With the truck and trailer, we had about \$100,000 invested. And basically not having any idea if this was going to take off, it was a big gamble,” Crigger says. “We were definitely fortunate: Right now the revenue that DMS creates is about 15 to 20 percent more than the plumbing and drain cleaning. It’s really taking off.”

So much so that Crigger made another significant investment last year and purchased an epoxy truck — a Raven Lining Epoxy SP50 Graco. “That was a big whoop-de-do. Once again, I had no idea if we absolutely needed that. We had worked six years without it, but things have changed in those six years and it’s working out for us.



“AT THAT POINT IN 2010, I WAS LOOKING TO DIVERSIFY AND WE WERE LOOKING INTO PORTA-POTTIES, WE WERE LOOKING AT A JETTING SERVICE, AND WE WERE LOOKING INTO DIRECTIONAL BORING. AND THEN I STUMBLED ACROSS MANHOLE REHAB.”  
Jeff Crigger

“With the epoxy pump, the box truck to put it in, and the compressor, we were at about \$85,000. Maybe for some big companies that’s not a lot, but to me that’s a chunk of change,” Crigger says.

Building their reputation for manhole rehab took a lot of footwork again. “At the time, Ted, Nate and I went door to door. We finally figured out we needed to go to the general contractors who get these jobs. We thought it could be a lost battle just going to engineers and the townships, because for the most part they’re not going to be doing this work. They’re going to be contracting this out,” Crigger says. “Now we have an awesome relationship with half a dozen general contractors.”

Today, DMS’ service area spans three states: Illinois, Iowa and Missouri. “We have certain areas that we cover with our Permaform equipment. They were so impressed with the way we operate — and I have to blame that on Ted — that they let us leak into other areas because their contractors weren’t taking care of the customers.”

After nearly two decades, Dependable Drain & Plumbing has built up a substantial stable of equipment to back its diverse services. Excavation and heavy-duty equipment include a John Deere 310 Extendahoe tractor, LHI mini-excavator, Wacker ST45 track loader, Manitou forklift, and Ultra Shore shoring. Other essential equipment includes a McLaughlin Mole, Doolittle trailer with Machines Technology pump and mixer (Graco), Generac GP17500E generators, and a Vanair Viper air compressor.

## SPREADING OUT

In the next five years, Crigger hopes to expand his company’s manhole rehab. “What I’d like to do is have Ted running two crews on the DMS side of things. We can easily get another trailer to do that just because of the amount of work that’s out there.”

Although nothing is set in stone yet, Crigger says that could easily change. “My wife knows how I am when I get the itch to do something else,” he says. “I don’t have any plans right now, but that could change in a year and I could get into something else. I think as far as any big changes, it will probably be on the Dependable Maintenance side where we’ll spread our wings.”

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 All Jetting Technologies, Inc. SEE AD ON PAGE 77	<b>ALL JETTING TECHNOLOGIES, INC.</b> 2740 SW Martin Davids Blvd., Palm City, FL 34990 772-286-1218 • (f) 772-286-0069 www.alljetting.com • info@alljetting.com				✓					✓	✓
SEE ADS ON PAGES 33, 69	<b>ALLAN J. COLEMAN CO.</b> 5725 N Ravenswood Ave., Chicago, IL 60660 773-728-2400 • (f) 773-728-2499 www.allanjcoleman.com • info@allanjcoleman.com	✓	✓	✓		✓	✓				✓
SEE AD ON PAGE 62	<b>AMAZING MACHINERY LLC</b> 3807 Old Tasso Rd., Cleveland, TN 37312 800-504-7435 • 423-790-1600 • (f) 800-504-7436 www.amazingmachinery.com • info@amazingmachinery.com	✓	✓	✓		✓	✓	✓		✓	✓
SEE AD ON PAGE 77	<b>AMERICAN JETTER</b> 6908 Pine Grove Rd., Knoxville, TN 37914 866-944-3569 • 865-524-4647 • (f) 865-247-5105 www.americanjetter.com • andy@americanjetter.com	✓		✓		✓	✓				
 Boatman Industries Inc. SEE AD ON PAGE 70	<b>BOATMAN INDUSTRIES</b> 7355 Airport Blvd., Houston, TX 77061 713-641-6006 www.boatmanind.com • eric.boatman@boatmanind.com		✓	✓	✓		✓	✓		✓	✓
 Cam Spray SEE AD ON PAGE 48	<b>CAM SPRAY</b> 520 Brooks Rd., Iowa Falls, IA 50126 800-648-5011 • 641-648-5011 • (f) 641-648-5013 www.camspray.com • sales@camspray.com	✓		✓	✓	✓	✓	✓			
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SEE AD ON PAGE 63	<b>NLB CORP.</b> 29830 Beck Rd., Wixom, MI 48393 800-227-7652 • 248-624-5555 www.nlbcorp.com												✓
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# Don't Lose Interest in Your Loans



Erik Gunn is a magazine writer and editor in Racine, Wisconsin. Direct Money Manager inquiries to [editor@cleaner.com](mailto:editor@cleaner.com).

Take the time to review your rates and stay well-informed as the cost of borrowing begins to increase

By Erik Gunn

After years at rock bottom, interest rates are slowly creeping up. They're still comfortably low — making your borrowing cheap and your savings account stingy. But the Federal Reserve has already raised the federal funds rate to 1.25 percent in June, and another increase is “widely expected” in the coming months, says Neil Staeck, business development officer at Wisconsin-based Educators Credit Union.

“The amount of the increase and the time frame of course remain to be seen, but the likelihood increases as the economy continues to grow,” Staeck says.

So what does that mean for you and your business? Quite a lot, actually. The obvious impacts are what you'll pay the next time you finance a major equipment, construction or real estate purchase. But it will also affect what you're paying in revolving debt.

Short-term debt isn't the only thing affected. “Long-term fixed rates on real estate secured loans will also creep higher over time, and adjustable-rate mortgages are probably headed toward a sizeable increase,” says Staeck.

So what do you do about it?

## BE INFORMED

The first thing is to refresh yourself on where things stand for you right now.

“In a rising-rate environment, it doesn't hurt a business owner to take a look at the loans they currently have and just see how they're structured,” says Joe Pieper, senior vice president of commercial banking at Westbury Bank, a Milwaukee-area community bank.

“It's important for business owners to know the terms of their existing debt,” adds Staeck. As rates go up broadly, the interest rates on your credit cards and lines of credit will increase.

Even if you have a locked interest rate, “it's still important to know how long that rate is locked in for,” Staeck points out. “By the time that note matures, rates may have increased and you'll be renewing at a higher rate.”

## EXPLORE YOUR OPTIONS

After reviewing your paperwork, give your bank a call. If your line of credit has the usual floating rate, see if there's an option to convert to a fixed rate, Pieper suggests. “Depending on how the loan is written, there may or may not be that option, but it's certainly a conversation worth having with your banker.”

## DECISIONS, DECISIONS

All of these questions become more urgent if you're already in buying mode, whether for equipment or even real estate — perhaps a larger shop.

When equipment purchase is involved, ask your banker or accountant whether it's a good idea to get a longer-term fixed rate to lower the monthly payments — “but that ties back to what your cash flow is,” he cautions. “If you're debt-averse and you have good cash flow, and you're looking to acquire a piece of equipment, it may still make sense to do something on the shorter term — maybe two or three years — to pay it off.”

The calculus is different with real estate, however. “If you're talking about adding on to your building or buying a building for the first time, in a rising-rate environment it's certainly in your best interests to try and get a longer-term fixed rate,” Pieper says.

And you might need to shop around a bit. “Some banks will lock rates up to five years, some banks will lock rates up to 10 — it all depends on the bank and how they structure these types of loans,” he points out. “There isn't a magic bullet, there isn't a magic formula that all banks tend to subscribe to. It's truly bank by bank based upon their appetite for new business loans or their risk appetite for certain types of industries.”

## CALCULATIONS

Pieper also suggests that interest rates alone aren't the only criterion to consider when you borrow money for your business — and the criteria can shift depending on the size of the loan.

“If you're borrowing \$25,000 or \$50,000 for equipment or a truck, at the end of the day the monthly payment is what's important to you,” he says. Of course, you want to negotiate a fair interest rate, but the term of the loan itself is probably a higher priority. You want “to make sure that it fits in your cash flow,” he explains — and in the overall cost, a slightly higher interest rate in return for easier payments is worth the reduced cash-flow pressure.

“Now, if you're borrowing a half a million or a million dollars for a building purchase, the interest rate is certainly a little more important,” he continues. Even there, however, “I would focus more on the availability of credit and the access to capital than the cost of capital.”

## SILVER LINING?

You can also benefit, at least modestly, from rate increases, Pieper observes — thanks to your business checking account.

Perhaps you have one of the small-business accounts with a low, fixed-fee structure that stays the same regardless of interest rates. On the other hand, he notes, it's common for bigger business-checking accounts to tie fees to interest rates. Under those circumstances, “as rates go up your fees inevitably should decrease a little bit because you're getting more earnings credit for the deposits that you're keeping in the bank,” he says.

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The bottom line? “It’s not only good to talk to your banker about the liability side of your balance sheet — your loans and payments and your interest rate — but make sure your banker’s talking to you about cash management,” Pieper says. “Making sure that you’re in the right checking account, making sure you understand what you’re paying for: what services or products you’re getting from the bank and what they cost.”

This may be as good a time as ever to conduct a thorough review of your account with your banker, understanding exactly what products or services are offered that you might not know about. And when you do that, “make sure your banker’s talking to you as much about the asset side of your balance sheet as they are about the liability side.

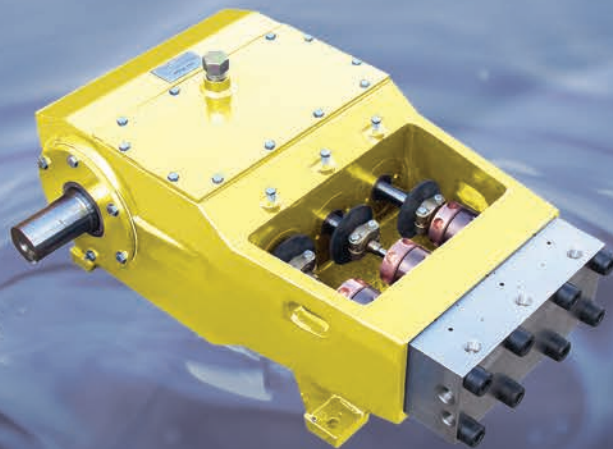
#### **KEEP CALM**

Two things to remember, though, as you ponder these questions.

First, don’t panic. “I wouldn’t advise anyone to rush into buying something because rates are rising,” says Staeck. “Do what makes sense for your business, and if you’re unsure of what to do, talk with a business lender, accountant or financial adviser for advice.”

Second, you’re not alone. Your business “isn’t the only one dealing with these changes,” Staeck says. “So are the companies and consumers you work with on a daily basis. If you adjust your business practices to compensate for the higher cost of borrowed money, keep in mind that your customers, vendors and suppliers might be changing theirs as well.”

Boiling it down? Be informed. Talk to your banker. Consider your options. And breathe easy. The changing interest rate environment is something you need to pay attention to. But it’s just one of many concerns you’ll need to juggle as you keep building and running your business. **c**



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# Out of Breath

Hydrogen sulfide dangers in confined spaces pose a serious threat to workers

By Sherree Geyer

**F**ailure to wear breathing apparatuses while repairing a sewage leak in the basement of a water treatment facility last year cost the lives of two maintenance mechanics from Wichita Falls, Texas.

Daniel Arredondo and David Sheppard were trained in the use of personal protective equipment and safety protocols. Plant officials warned the men of a gassy smell in the area. They entered the basement wearing self-contained breathing apparatuses, but it would later be found that the pressure in their air tanks was low.

Confined spaces, such as basements, pose health and safety risks for workers and rescuers exposed to hydrogen sulfide — a colorless, flammable, extremely hazardous gas that smells like rotten eggs. The National Institute of Occupational Safety and Health considers confined spaces to be those with limited entrances and exits, poor ventilation and “not intended for continuous worker occupancy.”

“Because it’s heavier than air, H<sub>2</sub>S can collect in low-lying and enclosed spaces, such as manholes, sewers and underground telephone vaults. Its presence makes work in confined spaces potentially very dangerous,” explains Wes Scott, director of consulting for the National Safety Council.

Dave Donohue — owner and principle partner of Mid-Atlantic Emergency and Safety Consultants, Hagerstown, Maryland — says, “Any space where there is organic matter decomposing, including sewers and solid-waste storage areas, can have H<sub>2</sub>S present. Caution should be taken before entering those areas,” he advises.

The health effects of H<sub>2</sub>S depend on how much of it a worker breathes and for how long. Effects range from mild (headaches or eye irritation) to very serious (unconsciousness and death).

Paul Moore, chief, fatality investigations team, NIOSH Division of Safety Research, says “H<sub>2</sub>S can be smelled at low levels, but with continuous low-level exposure or at higher concentrations you lose your ability to smell the gas. At high concentrations, your ability to smell the gas can be lost instantly.”

Once concentrations around 150-200 ppm are reached, the olfactory nerve becomes paralyzed after a few breaths. So, the odor is no longer detectable. “By 1,000 ppm, a single breath can cause immediate collapse and death,” Donahue says.

Employers must provide respiratory and eye protection and fire-resistant clothing if engineering and administrative controls cannot reduce H<sub>2</sub>S below OSHA’s permissible exposure limit. “Employers must also complete a PPE hazard assessment and equipment selection process in accordance with the OSHA regulations before beginning work activities,” Scott says.

His recommendation: “For exposures below 100 ppm, use an air-purifying respirator with specialized canisters/cartridges for H<sub>2</sub>S. For exposures at or above 100 ppm, use a full-face pressure-demand SCBA

with a minimum service life of 30 minutes or full-face pressure-demand supplied-air respirator with auxiliary self-contained air supply. Exposures at or above 100 ppm are considered immediately dangerous to life and health,” he stresses.

If the gas cannot be removed, use appropriate respiratory protection and other necessary PPE, rescue and communication equipment. Atmospheres containing high concentrations (above 100 ppm) are considered immediately dangerous to life and health, and SCBA is required.

Donahue notes, “If conditions in the confined space are not compatible with life, the incident shifts from rescue to recovery with steps needed to reduce hazards as the incident is no longer time-critical. It may be possible to change the atmosphere from toxic to safe using ventilations systems, he suggests, provided conditions have gone from high- to low-risk.

He ticks off a list of safety precautions that workers and rescuers should take to protect themselves, including appropriate detection equipment, such as meters to test for gases; PPE, such as respirators; a method to communicate in and out of the confined space; risk assessment for survival/actions to be taken; and command structure and incident action plan. He says rescue workers should “follow the instructions on the site safety plan, including continuous air monitoring and proper personal protective equipment.”

Generally, there should be a method to monitor the atmosphere for hazards. Lighting should be provided. The need to change the atmosphere, using fans or other ventilation systems, may also be needed, Donahue adds.

Moore says the same safety protocols for confined-space workers also apply to rescuers. “Rescuers should be aware of the hazards associated with specific types of confined spaces” and follow the standard on technical search and rescue incidents offered by the National Fire Protection Association.

Rescuers must be trained in rescue, CPR and first aid, and the specific H<sub>2</sub>S environment. Moore advises notifying emergency medical personnel and following the emergency action plan. “Always protect yourself first. Then, assist any victims in an H<sub>2</sub>S emergency. Above all else, follow the company’s policy on rescue. Never, ever, rescue unless you can do so right away!”

Almost half of the workers who die in confined spaces each year are would-be rescuers, Donahue notes. “They need to have the training, equipment and resources (including personnel) to effectively enter and rescue persons trapped in confined spaces.” **C**

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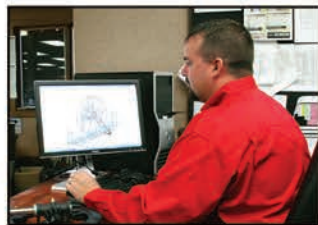
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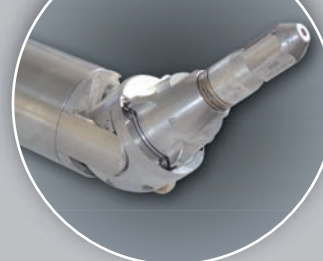
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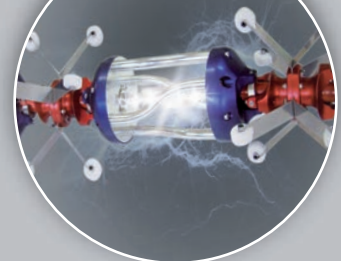
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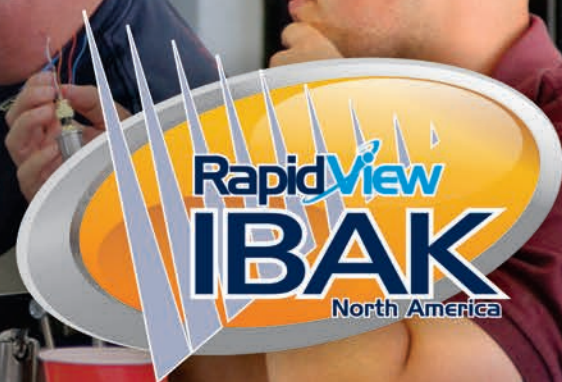
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# Bringing Culverts Back to Life

Large-diameter CIPP point repair system provides an economical alternative to full replacement

By Joe Bradfield

**T**renchless culvert replacement typically calls for auger boring or pipe ramming, but full replacement isn't always necessary. Cured-in-place point repair offers a permanent, alternative solution to culvert replacement with significantly better economy in some culvert remediation jobs.

Point repair is appropriate for round and oval pipe of a variety of materials, including clay, concrete, steel, cast iron, stone, corrugated metal and plastic. Defects such as deteriorated inverts and joint separation existing in otherwise sound storm and sanitary sewer mains, ventilation shafts or culverts can be excellent candidates for restoration using CIPP point repair.

Depending on composition, the service life of most culverts generally ranges from 50 to 100 years. Harsh site conditions, which might not have been present when the pipe was laid but developed over the course of time, can shorten culvert life expectancy and lead to premature failure. Usually the pipe must be completely replaced. On the other hand, culverts with isolated defects such as cracks, leaks, joint offsets and joint separation can be quickly restored to full service life expectancy using the cured-in-place point repair technique.

## PERMANENT SOLUTIONS

For the past two years, Hurk Underground Technologies has been using CIPP point repair to give its railway customers greater flexibility in their maintenance plans. Headquartered in Grinnell, Iowa, Hurk Underground is a culvert cleaning, restoration and subsurface drainage specialist. The company is a railway contractor of choice for culvert repair and replacement techniques that include auger boring, pipe jacking, pipe ramming, pipe bursting and pipe swallowing, as well as for large-diameter pipe renovation and repair with mechanical banding, pipe lining and, since 2014, CIPP point repair. These permanent culvert solutions prove invaluable to railway customers, since they have negligible effect on sensitive railroad substructures and don't interrupt commercial rail traffic.



A crew from Hurk Underground Technologies prepares a CIPP point repair liner from HammerHead Trenchless Equipment for installation in a railroad culvert with joint separation problems.

Company co-owner Doug Uitermarkt says most of the CIPP point repairs his crews have made are in the northern regions of Hurk Underground's service area where railroad substructures are subject to seasonal frost heave. The cyclical ground movement can cause the individual sections of bell and spigot pipe to separate from each other in only a few years.

"They usually don't ask us to fix small separations less than 4 inches, but that's up to them and their maintenance schedules. However, separations over 4 inches allow significant infiltration opportunities. We'll see where they are actually drawing down ballast from beneath the railroad ties."

In addition, Uitermarkt says the robustness of a CIPP point repair means he can confidently extend his customer's culverts. Whenever the width or the elevation of a roadway must be increased, the substructure typically needs to be widened. Often it requires widening the substructure beyond the length of the existing culvert.

A cured CIPP joint used to connect the extension is not only seamless, but in most cases is stronger and more corrosion resistant than the original pipe material. It ensures maximum flow capacity well beyond the expected service life of the existing pipe.

Uitermarkt says a CIPP point repair offers three significant advantages over mechanical banding. The first lies in the smooth edges of a CIPP lining. The thin, tapered profile of the finished CIPP point repair presents no impediment to flow and may actually increase flow rate capacities. The second is longevity. CIPP point repairs have high long-term strength retention and perform with superior abrasion and corrosion resistance. Third, in cases

>> The CIPP point repair system can be used to extend an existing culvert. Once cured, the high-strength resin and fiberglass matrix meets structural design standards set forth by ASTM F1216.

**BELOW** The crew uses a small compressor and ½-inch air hose to inflate the bladder. The bladder is held at 11 psi throughout the cure, which takes 1 ½ to 2 hours for a 34-inch pipe.



of joint separation due to soil movement, the CIPP point repair effectively eliminates the joint. Culvert integrity is no longer vulnerable to frost heave at the point of repair. From then on, soil can glide along the pipe without moving the pipe with it.

Uitermarkt says sometimes customers notify Hurk Underground of a culvert in need of repair, and sometimes Hurk crews will discover a pipe's defects while cleaning. "Whichever way it comes about," Uitermarkt says, "we work together with the customer to assess whether it needs attention right now or not and, if so, we advise which techniques should be used. Then we determine together which methods are most appropriate in the given case."

### BRIDGING GAPS

In its first year using the CIPP point repair system, Hurk Underground helped one of its major railway customers identify 15 culverts that could be saved without full pipe replacement or lining. Some had joints that separated due to frost heave, but others needed repair to eliminate infiltration at holes, offsets and misaligned pipes. Most joints with less than 4 inches of separation were determined not to be a serious concern. The customer instructed Hurk Underground to repair only joint separations greater than 4 inches. Separations less than 4 inches were considered on a case-by-case basis, and some of those were also repaired.

In one example, three of the five bell-and-spigot joints in a 50-foot-long, 34-inch-diameter culvert had greater than 4 inches of joint separation. "The other two joints in the pipe we agreed were not significant enough to require repair at this time. But one of the three we repaired had a 14-inch gap with substantial infiltration causing reduced flow from debris accumulation," Uitermarkt says.

Access to the pipe was difficult due to steep inclines and wetlands on both sides of the rail bed, but the point repair equipment is small and easily transported. "Basically, if you can get to the pipe to clean it, you can repair it," he says.

The crew made a ramp on one side for skid loader access and then cleaned the pipe to eliminate debris and loose material. Pipes did not have to be completely free of moisture, as the resin is moisture-tolerant and will

## WORKING THE SYSTEM

For the past two years, Hurk Underground Technologies has been using a CIPP point repair system from HammerHead Trenchless Equipment to give its railway customers greater flexibility in their maintenance plans.

The CIPP point repairs consist of a corrosion-resistant fiberglass composite lining using an odorless, styrene-free, VOC-free, ambient-cure silicate resin. Hurk Underground co-owner Doug Uitermarkt says each repair system comes with all of the consumable components his crews need to install the repair, including an inflatable bladder, protective bladder sleeve, and a disposable ground cloth to work upon. While Hurk Underground primarily works with corrugated steel, reinforced concrete, and bell-and-spigot culvert pipes in the 24- to 48-inch-diameter range, the CIPP system is compatible with all pipe materials and is available for pipe diameters from 3 to 48 inches.

Applications compatible for CIPP point repair include vehicular and railroad roadway culverts, cased ventilation shafts, and storm and wastewater drainage systems. Repairs maintain the culvert's inside diameter to within 0.25 inches, and overlapping bands permit coverage of larger areas up to the full length of a culvert and can also be used to add pipe, extending the length of the run beyond the original length of the host pipe.

Brian Kenkel, HammerHead Trenchless business development manager and CIPP point repair consultant, says the CIPP point repair products are certified by NSF International to NSF/ANSI 14, NSF SE 10990, the Uniform Plumbing Code and the International Plumbing Code. Once cured, the high-strength resin and fiberglass matrix meets structural design standards set forth by ASTM F1216. "And our CIPP point repairs have both an H20 live load rating for use under highways and a Cooper 80 live load rating for use in rail beds — and that's on their own, independent of the existing pipe."



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The point repairs have both an H2O live load rating for use under highways and a Cooper 80 live load rating for use in rail beds, independent of the existing pipe.

work even underwater. Once the pipe was cleaned, other than the CIPP point repair system itself and a small gasoline-powered air compressor, little else was required.

The crew mixed the resin and applied it to the 6-foot-long liner, ensuring the felt-fiberglass composite was thoroughly saturated. They placed the bladder in its protective sleeve and wrapped the wet-out liner around the bladder. Then they inserted the prepared bladder into the pipe, positioning it at the point of repair. The crew used a 1/2-inch air hose for faster inflation, filling the bladder with the small compressor in a little over two minutes to the manufacturer's recommendation of 11 psi. The bladder was held at 11 psi throughout the cure.

"Usually a cure for a 34-inch repair takes 1 1/2 to two hours. But it was unusually cold that morning, with temperatures ranging in the 20s throughout the day," Uitermarkt says. "That's not as cold as you might think because you have to remember that the temperature of the pipe was actually higher. The ground not only insulates the pipe from the outside air but tends to warm it through ground-source heat effect. But we allowed an extra 30 minutes anyway, for good measure."

The crew deflated the bladder and inspected the repair before moving to the next joint. A crew of four was able to complete two joints in a single day's work.

Uitermarkt says CIPP point repair restored the expected service life of the 15 culverts at one-third to one-fourth the cost of total pipe replacement or relining. **c**

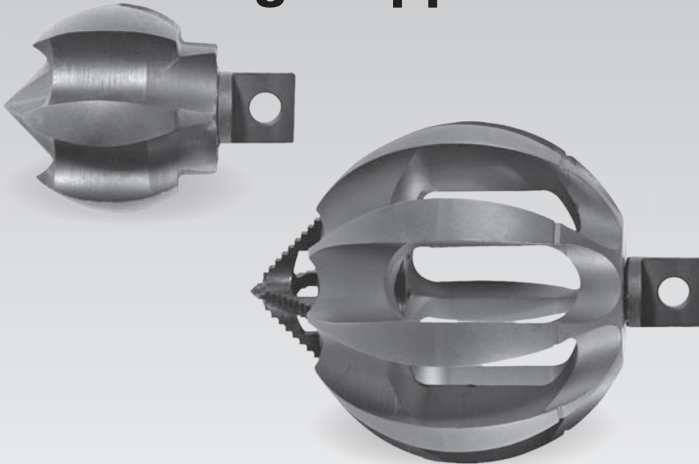
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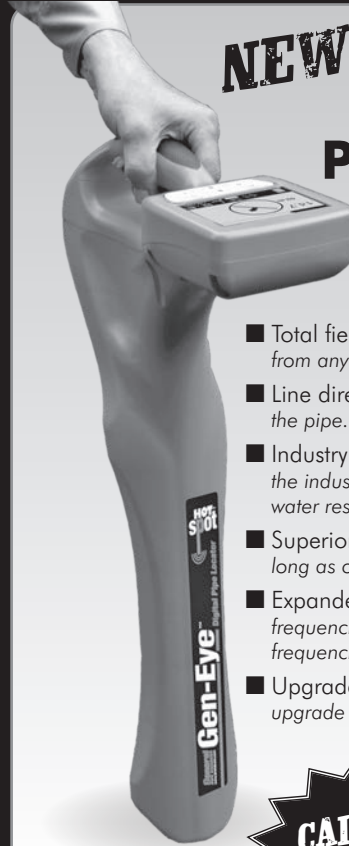
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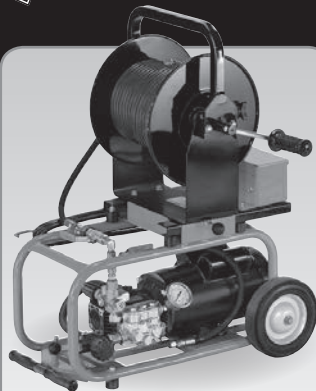
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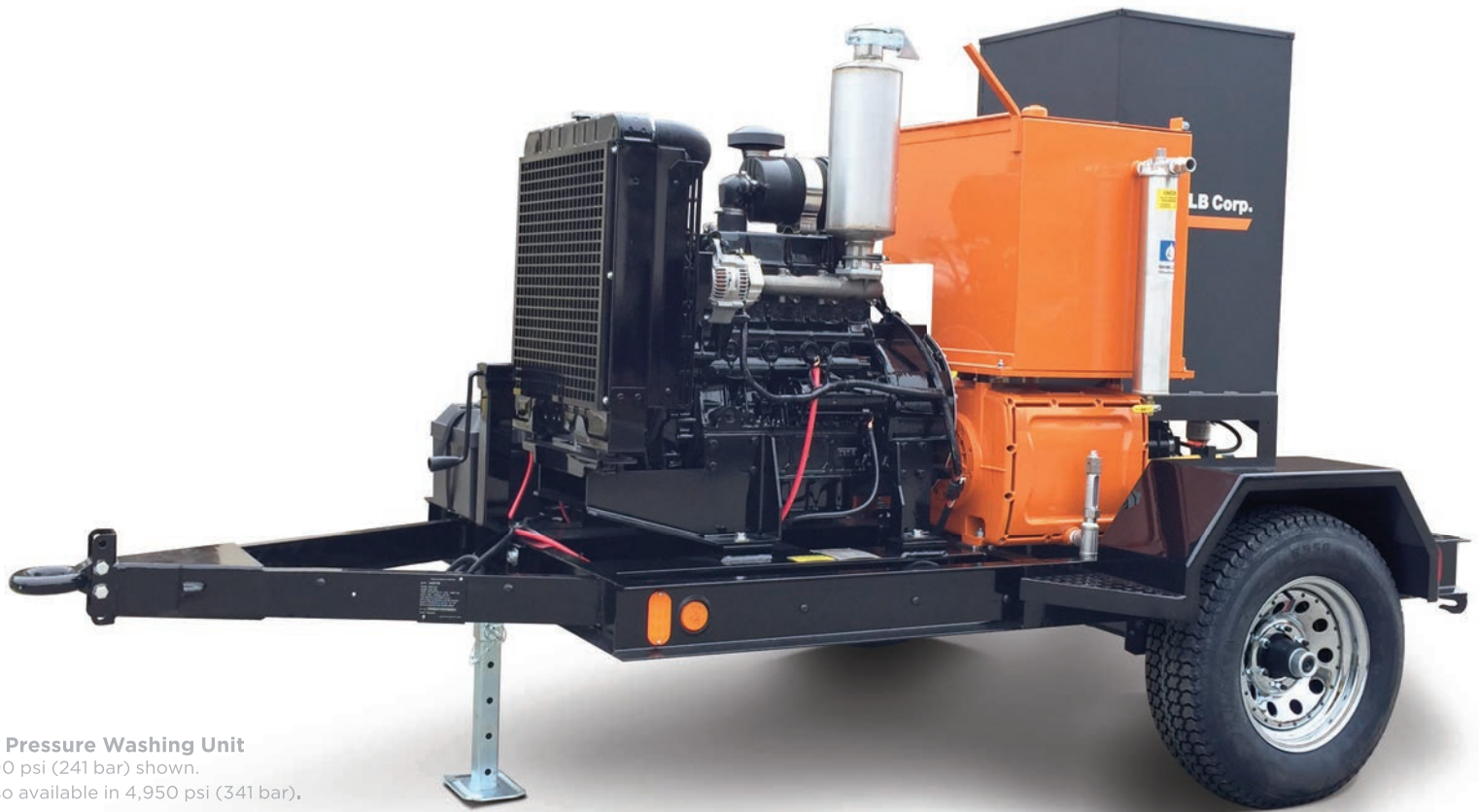
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The hand-crank 1125 Series pressure-washing hose reel from COXREELS helps users save time and allows for hassle-free maintenance. A compact design and quality steel construction are incorporated into units, with a sturdy, one-piece, all-welded A-frame base as well as a low-profile outlet riser and an open-drum slot design providing for a noncrimping, smooth hose wrap. 800/269-7335; [www.coxreels.com](http://www.coxreels.com).



### HANNAY REELS SERIES 6200

Series 6200 reels from Hannay Reels are ideal for waterblasting and cleaning applications. This durable, dependable reel handles single 3/4- through 1-inch I.D. hose, has a strong spool and frame to control hose expansion, hydraulic motor rewind, 50-pound chain and sprocket drive and a steel hub assembly rated to 3,000 psi. The standard inlet includes a 90-degree ball-bearing swivel joint with 1-inch female NPT threads, and the standard outlet includes 1-inch female NPT threads. Options include 5,000 psi working pressure, direct-drive hydraulic rewind, hose packages and roller assemblies to help guide hose when winding and unwinding. 877/467-3357; [www.hannay.com](http://www.hannay.com).



### NOZZTEQ LATERAL HOSE CART

Sewer cleaning crews often need to get into tight spots that jetting trucks can't reach, and sewer departments sometimes feel pressured to buy smaller jetting units. The Lateral Hose Cart from NozzTeq extends the reach of a jetting truck into small areas like laterals. It's a heavy-duty cart with good clearance and big wheels, and comes with a roll cage loaded with 200 feet of 1/2-inch, 4,000 psi sewer hose. It adapts to 3/4- or 1-inch jetting hose, comes with a 5,000 psi pressure gauge and shut-off valve and is rated for 5,000 psi, enabling the use of high-pressure jet streams and nozzles in places previously unreachable, and saving the expense of buying a portable pump or jetting unit. 866/620-5915; [www.nozzteq.com](http://www.nozzteq.com).



### REELCRAFT G9000 SERIES

G9000 Series high-capacity hose reels from Reelcraft are designed to be compact and allow for longer lengths of larger-diameter hose. The redesigned gooseneck can be removed from the reel for easier hose attachment. An external drive spring allows for convenient access to the spring components and improved servicing of the reel. The roller bearing inside of the pillow block produces a smoother spool rotation and easier operation. Models are available for 50-foot 1 1/2-inch I.D. low-pressure air and water hose, and 75-foot 1-inch I.D. and 3/4-inch I.D. medium-pressure oil hose. 800/444-3134; [www.reelcraft.com](http://www.reelcraft.com).

### VALLEY INDUSTRIES HOSE REELS

Valley Industries hose reels are available in 12-, 18- and 22-inch manual or electric-drive units. Each hose reel frame is made of lightweight aircraft-grade aluminum. They include a stainless steel core and threaded riser to eliminate the possibility of weld corrosion. Mounting holes are compatible with popular brands, and mounting points are located in the front for optional rollers for smooth coiling. 800/864-1649; [www.valleyind.com](http://www.valleyind.com).





## INDUSTRIAL VACUUM TRUCKS

### GAPVAX HV56

Constructed of 1/4-inch ASTM A572-Grade 50 steel, the **HV56** hydroexcavator from **GapVax** has a 15-cubic-yard debris body and water tank options ranging from 350 to 1,200 gallons. Its positive displacement blower is rated 5,250 cfm at 28 inches Hg. The tailgate is fully opening with a field-adjustable hinge and dual cylinders, and also has four individually adjustable locks to ensure a complete seal. Options include a cold-weather recirculation package, sludge pump, auger unloading system, body pressurization system, remote pendants and wireless remotes. It can be used for excavating, locating utilities, tunneling, slot trenching, conveying dry gravel and sand, or general cleanup. 888/442-7829; [www.gapvax.com](http://www.gapvax.com).



### GUZZLER CL

The **Guzzler CL** industrial vacuum loader is available with a dense-phase off-load option. The optional batch off-loading system is ideal for off-loading powders, such as cement and lime, into large silos. The truck offers 14.5 psi, via a direct drive cyclo-blower rotary pump

with up to 750 cfm of free-air displacement. The system pneumatically conveys material through a 4-inch hose up to 125 feet vertically. The rear of the dense-phase off-load configuration has a transfer cone with six fluidizing nozzles that fluff material into the air stream for improved material conveyance. The vacuum system operates effectively in remote or inaccessible locations more than 1,000 feet away. It provides accessibility to all internal chambers, and a low air-to-cloth ratio. It is also available with a vane pump pressure off-load system (high-pressure, low airflow) ideal for the vacuum loading of liquids, sludges and thicker materials. 800/627-3171; [www.guzzler.com](http://www.guzzler.com).



### TORNADO GLOBAL HYDROVACS F3 ECO

The **F3 ECO** from **Tornado Global Hydrovacs** holds 12 cubic yards of mud and more than 1,700 gallons of freshwater. This unit is over 2,000 pounds lighter than the company's older models, meaning the operator can carry up to 10,000 pounds

more payload in the debris tank, creating a savings in fuel consumption. The boom has a 342-degree rotation and a 26-foot reach. All critical components are housed in an insulated and heated aluminum van body. Because of its curved, sloped floor, operators do not need to hoist the tank to empty it. 877/340-8141; [www.tghl.ca](http://www.tghl.ca).

### VAC-CON INDUSTRIAL VACUUM LOADER

The **Industrial Vacuum Loader** from **Vac-Con** can produce airflows from 4,700 to 6,100 cfm and vacuum as high as 28 inches Hg depending on the application. It has a 16-cubic-



yard debris body capable of vacuuming wet or dry materials. Dual cyclonic bag houses make cleaning and decontamination easy. Filtration is provided by 26 pleated star bags, with a final filter capable of HEPA filtration. When vacuuming fine materials, an optional air cannon blasts the filter cartridges to maintain the proper air-to-cloth ratio for optimum conveyance. The air cannon, coupled with the automatic material return system, will efficiently return fines from the bag houses to the debris body. Options include hydroexcavation package. 904/284-4200; [www.vac-con.com](http://www.vac-con.com).

## NOZZLES



### ENZ USA UC LINE

The **UC Line** of CrossJet Technology from **Enz USA** can be used to clean heat exchangers and completely clogged pipes in industrial settings. These nozzles offer cleaning performance with low water consumption and long durability. The integrated design includes thrust jets, and models are available up to 22,000 psi. They are available in 9.5, 12, 18, 22 and 28 mm sizes, with a smaller 9.5 mm size coming soon. 877/369-8721; [www.enzusainc.com](http://www.enzusainc.com).

### ENVIROSIGHT JETSCAN HD

Deployed on any 3/4- or 1 1/2-inch jetter hose, the **JetScan HD** video nozzle from **Envirosight** is a quick, easy way for a cleaning crew to determine what tools and setup to use, identify blockages during emergency callouts, and document the outcome of cleaning operations. It captures valuable HD video footage from underground that can be viewed immediately afterward on a tablet. As it advances down pipe 8 to 24 inches in diameter, it records 720p HD video in MPEG format to an onboard SD memory card. Immediately afterward, the card can be removed and video viewed on an iPad or other SD-compatible device. Twin high-output LED lamps ensure bright, vivid footage. It lasts four hours on rechargeable lithium-ion batteries, and stores up to eight hours of video. 866/936-8476; [www.envirosight.com](http://www.envirosight.com).



### HYDRA-FLEX AQUA-ROCKET

The **Aqua-Rocket** industrial turbo nozzle from **Hydra-Flex** is constructed with a stainless steel housing and a tungsten carbide tip and seat to withstand harsh environments and provide long life. Equipped with a high-temperature, drop-resistant rubber cover and available repair kits, all components are designed for longer life and lower overall operating costs. It blasts a 0-degree water jet at 1,500 to 4,000 psi, while rotating at an optimal speed to form a 22-degree cone-shaped spray pattern. Its optimized stream quality results in greater impingement, allowing the user to attack the toughest dirt and grime. 952/808-3640; [www.hydrflexinc.com](http://www.hydrflexinc.com).



## JETSTREAM ROTOMAG X22

The **Jetstream RotoMag X22** 2-D, self-powered rotary pipe-cleaning nozzle has a stainless steel body and rotor, and a body shroud to protect it while cleaning. Available as a single tool rated up to 22,000 psi, it has a magnetic braking system that controls rotational speed for minimal wear and maximum impact without streaking. Spinning on a film of high-pressure water, the nozzle has no ball bearings to replace, making field service simple. The Premium Kit is available with all components needed for repair in a convenient watertight case. A variety of standard nozzles for different cleaning applications is available with the Jetstream RotoMag X22. Nozzle extensions come in three sizes to enable more effective cleaning in larger pipes. For large pipe applications, several different-style centralizers are available, including pipes with and without bends. The back-out preventer stops the tool from retracting out of the pipe unexpectedly or in the event of a sudden shift in thrust. 800/231-8192; [www.waterblast.com](http://www.waterblast.com).



## RAPIDVIEW IBAK NORTH AMERICA AQUACAM

The **AquaCam** from **RapidView IBAK North America** is a small-diameter camera that is propelled through the pipeline with water pressure, cleaning while it inspects. The jet housing surrounds the small 2-inch auto-uprighting color camera. It can be used on any of the company's pushrods, including LISY lateral-launch systems. It provides ideal image quality with super-bright LED lights illuminating the pipeline. 800/656-4225; [www.rapidview.com](http://www.rapidview.com).



## TAG NOZZLES ROTATING NOZZLE

The **Rotating Nozzle** from **TAG Nozzles** is designed to shred fine roots, and degrease or pulverize any kind of waste, including mineral deposits. Propulsion rear jets and rotating lateral jets ensure a powerful vacuum effectively providing 1,000 rpm. It can be used on pressure washers offering at least 25 gpm and 2,000 psi, and is available in 1/2- or 1-inch NPT sizes. It is made of stainless steel and brass. No maintenance is needed. Chains and a tip can be added to the nozzle to shred bigger roots or debris. [www.tagnozzles.com](http://www.tagnozzles.com).



## PORTABLE TRUCK/TRAILER JETTERS

### CAM SPRAY TT4025HZ-350

The model **TT4025HZ-350** trailer jetter from **Cam Spray** produces 25 gpm at 4,000 psi using a U.S. EPA Tier 4 Final Hatz Diesel 74 hp turbo intercooled, liquid-cooled engine. It comes with an over-center clutch, control panel with hour meter, low-fuel gauge, low-fuel shutdown, over-pressure shutdown and digital pressure readout. The reel is hydraulic powered with variable speed, and comes mounted on a slide-out with angle adjustment fitted with 500 feet of 5/8-inch hose, manual shut-off valve and analog pressure gauge. RCM



wireless remote control modes include valve open, valve close, engine idle down with a 15-second time delay shutdown, emergency shut-off, two-speed engine rpm control and auxiliary 10-amp circuit with on/off control. 800/648-5011; [www.camspray.com](http://www.camspray.com).

## ELECTRIC EEL EEL JET EJ3000

The **Eel Jet EJ3000** high-pressure jetter from **Electric Eel** cleans 2- to 8-inch-diameter drainlines for a fast blast through clogs including sludge, ice, grease, sand, soap, dirt and debris. It comes with steel nozzles to penetrate and clean tough problems from pipe walls with a variety of spray angles. It can be used to clean lines up to 300 feet, and offers 3,000 psi at 4.7 gpm, a 13 hp overhead valve engine for smooth running and dependable operation with electric start available, a 2-1 gear-reduced triplex pump with pulsation for longer life, a 300-foot-capacity hose reel, a throttle-back control that automatically adjusts engine speed, and a low-tone muffler for quiet operation. It uses 1/4- and 3/8-inch-diameter jet hose. It has 12-inch pneumatic tires for easy maneuverability on a rugged steel base with front bar for motor protection. 800/833-1212; [www.electriceel.com](http://www.electriceel.com).



## GENERAL PIPE CLEANERS JM-1000 MINI-JET



The compact, lightweight **JM-1000 Mini-Jet** from **General Pipe Cleaners** is designed to help clear small lines, clogged sinks and laundry drains from 1 1/2 to 3 inches with 1,500 psi of power. It hits the stoppage with high-pressure, wall-to-wall water spray, with pulse to help slide the hose around tight bends and farther down lines. At 22 pounds, the portable package measures 24 by 11 by 11 inches. The pump and motor assembly are safely contained in a diamond plate metal case. To protect the unit from damage, a sensor automatically stops the motor if water stops flowing through the pump. The unit includes Super-Flex high-pressure jet hose, a four-piece nozzle set, water supply hose, universal faucet adapter and spray wand assembly. It has a three-wire GFCI for safety. 800/245-6200; [www.drainbrain.com](http://www.drainbrain.com).

## HI-VAC CORPORATION O'BRIEN 7000 SERIES

The **O'Brien 7000 Series** trailer-mounted jetter from **Hi-Vac Corporation** comes with water tanks and a sediment pump for easier cleaning and longer life. The trailer has the muffler and air cleaner mounted inside the enclosure for improved sight lines, electric reel control for smoother rotation and easier operation, and hydraulic and water gauges mounted in the main control panel for easier viewing. 800/752-2400; [www.hi-vac.com](http://www.hi-vac.com).





### MONGOOSE JETTERS BY SEWER EQUIPMENT MODEL 184

The Model 184 jetter from Mongoose Jettors by Sewer Equipment has a tubular steel frame, corrosion-resistant pre-painted subassemblies, state-of-the-art controls, a strong hose reel, high-quality diesel engine and the Mongoose Run Dry Pump. 877/735-4640; [www.mongoosejettors.com](http://www.mongoosejettors.com).

### NLB CORP. 335DHW

The 335DHW hot-water jetting unit from NLB Corp. has a dependable triplex pump capable of 15 gpm at 3,500 psi, and a Kubota v3600 66 hp engine provides the power in a direct-drive configuration that eliminates the PTO and PTO maintenance. Its 700,000 Btu burner unit addresses the demands of the many cycles, long hours and transportation requirements in the life of a typical hot-water unit. An overhead-mounted water tank is easy to winterize and has integrated water lubrication lines and a 75-micron inlet strainer that can be rinsed or cleaned, eliminating the traditional filter. A rupture disk has also been eliminated from the unit's design and replaced with a self-resetting pop-off valve, saving time and money for the operator. 800/227-7652; [www.nlbcorp.com](http://www.nlbcorp.com).



### PIPELINE RENEWAL TECHNOLOGIES CLEANSTEER 40

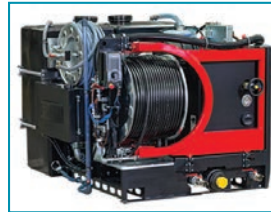
The Cleansteer 40 from Pipeline Renewal Technologies uses high-pressure water for propulsion, steering and cleaning as it captures live inspection video from inside lateral lines. Its design means it can traverse multiple bends in pipe, steer through branches and levitate above debris, allowing municipal contractors and commercial plumbers to locate failed pipes, cross bores and blockages, as well as perform cleaning. It is fully water-driven, as six propulsion nozzles generate the power needed to pull its own flexible hose through multiple bends, and a side nozzle on the camera can be aimed to steer through diverging pipes and hover past obstacles. An optional forward-facing nozzle can be pulsed to clear debris and other obstructions. The system works with any high-pressure water source, including pressure washers and combination trucks. Its 1/2-inch hose comes in lengths from 115 to 190 feet. 866/936-8476; [www.pipelinert.com](http://www.pipelinert.com).

### RIDGID KJ-2200 WATER JETTER

The RIDGID KJ-2200 Water Jetter propels a highly flexible hose through 1 1/4- to 6-inch lines, blasting through sludge, soap and grease blockages. As users pull the hose back, it power scrubs the line, flushing debris away, restoring drainlines to their full, free-flowing capacity. A working pressure of 2,200 psi and flow of 2.4 gpm provides fast, effective cleaning of lines. It comes standard with a 6.5 hp recoil-start gasoline engine for quick start and an FV-1 foot valve to make remote or indoor operation simple and convenient. The user controls the jetting action at the



drain while leaving the jetter outdoors. Simply guide the hose into the drain while the thrust propels the hose down the line. Activate the pulse action to easily navigate difficult bends and traps. An optional H-30 cart makes for easy job site transport. 800/769-7743; [www.ridgid.com](http://www.ridgid.com).



### SPARTAN TOOL WARRIOR

The Warrior jetter lineup from Spartan Tool includes the Urban and Ultimate Urban Warriors. Using 50 and 65 hp Kubota engines, the Urban Warrior provides 3,000 psi at 19 gpm, while the Ultimate Urban Warrior provides 4,000 psi at 21 gpm. A high-flow unit provides 2,300 psi at 32 gpm. The Urban Warrior's high-pressure hose reel holds 460 feet of hose and pivots 180 degrees, while the Ultimate Urban Warrior holds 520 feet of hose and pivots 270 degrees for optimum working conditions in all circumstances. 800/435-3866; [www.spartantool.com](http://www.spartantool.com).



### SUPER PRODUCTS SUPERJET

The SuperJet truck-mounted jetter from Super Products has a double-acting, single-piston hydraulically powered water pump that offers 1-1 oil-to-water ratio and rated design capacity of 100 gpm and 3,000 psi continuous duty. Its modular water tank setup easily accommodates capacities from 1,000 to 3,200 gallons. It has a single-engine design that emits lower sound levels, reducing fuel use by 40 percent compared to dual-engine units. Its rear compartment is heated with an 80,000 Btu/h heater that enables year-round operation in freezing environments. An easy-to-use control panel performs a number of functions including adjustable engine throttle with water pressure speed dial; on/off water pump PTO; water pressure gpm; and hose reel joystick, pay-in/pay-out with speed control. 262/796-5939; [www.superproductsllc.com](http://www.superproductsllc.com).

### US JETTING JETVAC

The JETVAC from US Jetting has an RB-DV 65 Robuschi blower pulling 850 cfm and 25 inches Hg, and an efficient cyclone system with silencers and filters that are easy to maintain. The unit has a USJ pump with 3,000 to 4,000 psi and 10 to 18 gpm options available. Options for different vacuum hoses, jetting nozzles, high-pressure hoses, guns for hydroexcavation, surface cleaning and washdown are available. A 550-gallon debris tank and a 200-gallon water tank help keep the size and weight down so a CDL license is not required. It is equipped with a high-dump system to dump loads into a standard dumpster for transportation or storage. 800/538-8364; [www.usjetting.com](http://www.usjetting.com).



## VECTOR RAMJET 850 SERIES

The **Vector RamJet 850 Series** truck jetter has a choice of front or rear hose reel locations, and productivity-enhancing options such as an aluminum rear shroud and optional JetRodder water pump-heated cabinet. An integral aluminum rear shroud with heavy-duty, see-through Lexan windows is available.

Large service access doors on both sides of the shroud enable easy greasing, maintenance and service. The rear shroud keeps the hose and components warm and protected in cold conditions. It comes with a certified flow of 0 to 80 gpm at a variable pressure up to 2,500 psi. Park-N-Clean technology allows the operator to park near the manhole and, with minimal setup time, start cleaning within minutes. **800/627-3171; www.vector.com.**



## VECTOR TECHNOLOGIES VECJET

The **VecJet** line of powerful, compact trailer-mounted jetter machines from Vac-Con, in cooperation with **Vector Technologies**, feature a high-pressure water jet system with a Vac-Con hose reel. They come standard with

a 99 hp Kubota diesel engine, a 500- or 700-gallon water tank, 500 feet of 1/2- or 3/4-inch jetter hose, and water flow of 25 gpm at 4,000 psi or 40 gpm at 3,000 psi. **800/832-4010; www.vector-vacuums.com.**

## SAFETY EQUIPMENT

### ALL JETTING TECHNOLOGIES UHP NOZZLE COVER

The snap-on **UHP Nozzle Cover** from **All Jetting Technologies** is designed to protect nozzle tips and the nozzle carrier from debris backlash while waterjetting at pressures of 20,000 to 55,000 psi. After nozzle tips are loaded into the nozzle head carrier, the protective cap is simply snapped on over the nozzles. The cover is designed to protect the nozzles from abrasive debris that is being removed. It can help increase the longevity of the nozzle head carrier and the nozzles. **772/286-1218; www.alljetting.com.**



### FSS SOLUTIONS GEROTTO LOMBRICO REMOTE-CONTROLLED MINI-EXCAVATOR

The **Gerotto Lombrico Remote-Controlled Mini-Excavator**, distributed in the U.S. by **FSS Solutions**, is ideal for confined spaces and no-man entry. The track-driven unit can be used to vacuum settled material in sewage pipelines, manifolds and tunnels larger than 2.6 feet in diameter. Equipped with a suction tube, it is hydraulically driven from the vacuum truck's hydraulic circuit or a power pack, and controlled through a hydraulic manual manifold. It includes customizable head configurations for a variety of applications, and distances the vacuum truck operator from the powerful vacuum system, limiting the operator's exposure to tight spaces and potentially hazardous materials, and increasing productivity and job site safety. **800/822-8785; www.fssolutionsgroup.com.**



## SPITZLIFT 3-FOOT FOLD-DOWN CRANE

The **SpitzLift 3-foot fold-down crane** is made of lightweight aircraft-grade aluminum and weighs less than 40 pounds. It has a robust load capacity of 650 pounds, and can be installed in vans and enclosed service vehicles for both rear and side-door applications. Because the crane is lightweight, it can be transferred easily from one mounting system to another. This portability feature increases efficiency, versatility and multipurpose use. The unit is well fitted for enclosed service vehicles and vans because when not in use, it stores neatly out of the way so to not interfere with workflow or take up valuable cargo space. When ready to use, the ergonomic design allows for simple set up to the operational position. It helps increase workplace safety and efficiency as a premier lifting solution for equipment handling. **619/713-5061; www.spitzlift.com.**



## TERYDON LUNCH BOX

The **Lunch Box** from **Terydon** is a universal control system designed to provide a safer and more productive work area for waterblasting systems. Designed around a touch-screen tablet, it connects to a variety of pneumatic hands-free tools and accessories, allowing the operator to be removed safely from the hazard of high-pressure water. Using an encrypted Bluetooth wireless signal, the tablet not only voids the need for cables and hoses — eliminating the risk of slips, trips and falls — but also enables the operator to locate for optimal viewing of the tool. The Android app provides a user-friendly layout of controls and commands so a single operator can perform the tasks of multiple workers from just one tablet. The operator can also download a multitude of performance-enhancing software upgrades, all focused toward specific applications. **330/879-2448; www.terydon.com.**



## TST SWEDEN HD SERIES

The **HD – Heavy Demolition Series** of protective clothing from **TST Sweden** has a durable outer material, **TECHSTEEL**, which is 50 percent stronger against abrasion and tearing compared with the outer material that it replaces. It incorporates Vectran, a high-performance multifilament fiber spun from liquid crystal polymer. It forms the base and then different methods are used to treat and prepare the fabric. The collection is available as a jacket, trousers and gaiters, and broadens the company's waterjet protection range of clothing. It offers certified protection against pin/single nozzles of up to 29,000 psi water pressure and for 43,500 psi rotating nozzles. **www.tst-sweden.com.**



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## WATER PUMPS

### HAMMELMANN CORP. HDP-500

The HDP-500 trailer series high-pressure pump from Hammelmann Corp. has a fluid end that is sealed, preventing any water leakage during operation. The 750 hp range pump is convertible from 5,000 to 45,000 psi. It combines a compact integral speed reduction gear end with the concept of a vertical configuration. The vertical configuration channels oscillating forces directly downward into the base structure. Unwanted lateral oscillations as produced by horizontal pumps do not occur. The integral speed reducer with twin helical gears arranged in a herringbone configuration ensures smooth running and even power transmission without axially loading the bearings. A selection of gear ratios is available to allow the optimal choice of driver. The compact construction eliminates the need for an external gearbox and prevents rotary oscillation. Mechanical efficiency is in excess of 95 percent. 800/783-4935; [www.hammelmann.com](http://www.hammelmann.com).



### PSI PRESSURE SYSTEMS NX-365

The NX-365 operation pump from PSI Pressure Systems has one of the quickest conversions in the industry thanks to the pump's single integrated manifold fluid end design featuring a discharge manifold rated for all pressures up to 40,000 psi. Its redesigned Gen 2

layout allows for safe, easy access and has a spacious platform for optimal mobility, creating a safer work environment for its users. 855/775-5055; [www.psi pressuresystems.com](http://www.psi pressuresystems.com). c

# Waterblasting and Waterjet Cleaning and Accessories

By Craig Mandli



## UNIT REMOVES ASBESTOS COATINGS FOR BUILDING DEMOLITION

### PROBLEM

Rhine Demolition needed to remove asbestos coatings from a building prior to demolition in downtown Seattle to make way for construction of the new Amazon headquarters.

### SOLUTION

The company rented an Aqua Miser D115 from CESCO for coatings removal. Technicians also utilized Aqua Safe protective suits to stay safe.

### RESULT

The equipment cut their normal production time in half. Even with all the rentals and equipment needed to do the job, Rhine Demolition was able to double their profit for this component of the job. The company looks forward to utilizing the equipment for floor mastic jobs as well. 800/394-4987; [www.aquamiser.com](http://www.aquamiser.com). c

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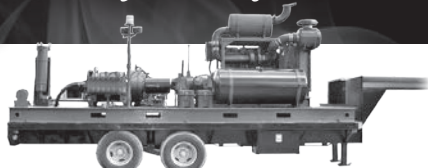
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PRODUCT SPOTLIGHT

**Delco steps into the trailer jetter market**

By Craig Mandli

Delco is a known name in the cleaning industry. That 50-year-old brand can be found on high-pressure hose and pressure washers around the world. The Boss Sewer Jetting System expands on the Delco name with the company's first foray into the jetting industry.

"Really, it's a beefed-up version of what we do and what the Delco name is known for," says Matt Wendt, national sales manager for Delco.

The Boss is powered by a high-efficiency 56 hp Kohler KDI Tier 4 diesel engine, and comes equipped with an HPP industrial low-speed triplex pump with a stainless steel pump head that offers a maximum pressure of 3,500 psi at a flow rate of 21.7 gpm. The heavy-duty hydraulic drive-system-powered hose reel comes furnished with 400 feet of 1/2-inch JetXtreme jetter hose. A 335-gallon poly tank provides plenty of water to stay on the job longer, while the reel system has an articulating arm and offers a swivel base for 180-degree rotation. A level-laying rewind system is designed to reduce operator fatigue.

"Delco has been designing hose and hose reels for the pressure washer industry forever, so we know what we're doing," says Wendt. "We've built trailers for mobile pressure washer systems before, but this is our company's first trailer jetter unit."



The powder-coated steel frame is designed for heavy use in adverse conditions, with 16-inch aluminum wheels and an axle rated to 7,000 pounds. Perhaps the biggest selling point of the new unit, though, is its wireless remote that allows the technician to operate the hose reel, engine throttle and pulse valve from up to 300 feet away. "The operators who have seen this unit love the safety aspect of being able to operate it from a distance," says Wendt.

The unit's Forever Silent engine enclosure also makes it a fit for jetting work in populated areas. It includes an engine control unit with fuse circuit protection and a digital control display with integrated throttle control.

"The Boss is a great next step for a drain cleaner that is getting into municipal and industrial sewer jetting," Wendt says. "That's a trend we've noticed with a lot of our pressure washer customers. They've been asking us to go into jetting, and so far the response has been great." 847/348-1593; [www.delco-cleaning.com](http://www.delco-cleaning.com).



1



2



3



4

**1 COXREELS PIN LOCK FOR CHALLENGER SERIES**

The pin lock mechanism by COXREELS is available for the Challenger Series. The lock secures the drum and prevents the hose from unspooling when the reel is not in use. The assembly can be used on any of the Challenger models, including the 12- and 17-inch discs. 800/269-7335; [www.coxreels.com](http://www.coxreels.com).

**2 PICOTE WIRE BRUSH**

The Picote wire brush range is a safe option for smaller-diameter PVC pipes. They are designed specifically for lightly removing any buildup of scale. Used with the Micro or Mini Miller machines, they come in pipe diameters of 2, 3, 4 and 6 inches. There are additional brushes for the Maxi Miller machine in pipe diameters 4, 6, 8 and 10 inches. 219/440-1404; [www.picotesolutions.com](http://www.picotesolutions.com).

**3 PTC WATERBLASTING HPP SERIES PUMPS**

The HPP Series pumps from PTC Waterblasting are rated to 40,000 psi and 600 hp, and can be mounted in either a vertical or horizontal position. They feature integrated gear reduction for a compact configuration and a standard pneumatic pressure regulator for easy and precise pressure control. The regulators are available in both 0-20K and 0-40K configurations to accommodate a wide range of either dry-shutoff or dump-style tools. 320/340-6481; [www.ptcwaterblasting.com](http://www.ptcwaterblasting.com).

**4 HYDRA-FLEX AQUA-ROCKET TURBO NOZZLES**

Hydra-Flex's Aqua-Rocket industrial turbo nozzles are constructed with stainless steel housings and tungsten carbide nozzle tips and seats to withstand harsh environments and provide longer life. The nozzles are equipped with a high-temperature, drop-resistant cover for less maintenance. 952/808-3640; [www.hydraflexinc.com](http://www.hydraflexinc.com). c



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## #2 Super Durable Components

While our CCTV cameras have a well-earned 30-year reputation for performance and durability, RST complements these productivity tools with extreme-duty cable reels with self-aligning sealed bearings, aircraft-grade aluminum framing, ultra-durable plastics and more.

## #3 Smart Workspaces

We could save time and money using only off-the-shelf cabinetry, but custom building tool bins, counter tops, and workstations translate to better fits, more room, and better work flows.



## #4 Single Conductor Technology

RST's CCTV equipment utilizes Single Conductor Technology, which offers multi-function flexibility, great video quality, and power through a nearly indestructible steel-wrapped cable. We back up our cable with an industry-leading 5-year warranty.



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**Continental ContiTech adding to its Iowa manufacturing center**

Continental ContiTech announced it is investing approximately \$12 million in its PVC hose business in North America and is expanding its manufacturing capabilities and production capacities with a new competence center at its Mount Pleasant, Iowa, plant.

**The McAlear Group forms to create employee unity**

The launch of The McAlear Group brings together Drincables Direct, Service Spring Corp., and Innovative Machine and Manufacturing as one brand to serve their employees. The new group will offer the same resources, support and opportunities to employees across multiple companies.

**Scott Eicher joins Sprayroq**

Sprayroq announced the addition of Scott Eicher to its corporate team as director of corporate development. Prior to joining Sprayroq, he was president of Foam Fusion, a company he started to apply foam and coatings for the residential and commercial markets.



Scott Eicher

**JD7 names vice president**

JD7 announced that Emma Quail has joined the company as vice president. She will be managing the service, sales and distribution of pipeline assessment technology across North America.

**Hi-Vac hires new industrial sales manager**

Hi-Vac hired Dennis Zorn as the new western territory sales manager. He brings over 30 years' experience, including many years with industrial vacuum systems, bulk material handling and process automation.



Dennis Zorn

**Ring-O-Matic makes additions to dealer network**

Ring-O-Matic announced that its full product line of vacuum excavators, vacuum units and pit cleaners is now available from 22 more locations through six of the industry's equipment dealerships.

**Water-Right hires Jankowski as associate brand manager**

Water-Right announced the hiring of Kira Jankowski as associate brand manager. She will be responsible for upholding the company's brand image and long-term strategy, as well as supporting the marketing strategies and creative campaigns for wholesale distribution, commercial, industrial and private label segments. **c**



Kira Jankowski

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