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**PRODUCT  
FOCUS  
34**



Dave Marzio  
Owner  
Spearhead Locating Services

**PROFILE:**

**GETTING MORE FROM  
GROUND-PENETRATING  
RADAR EQUIPMENT  
20**

## FINDING A NEW PATH

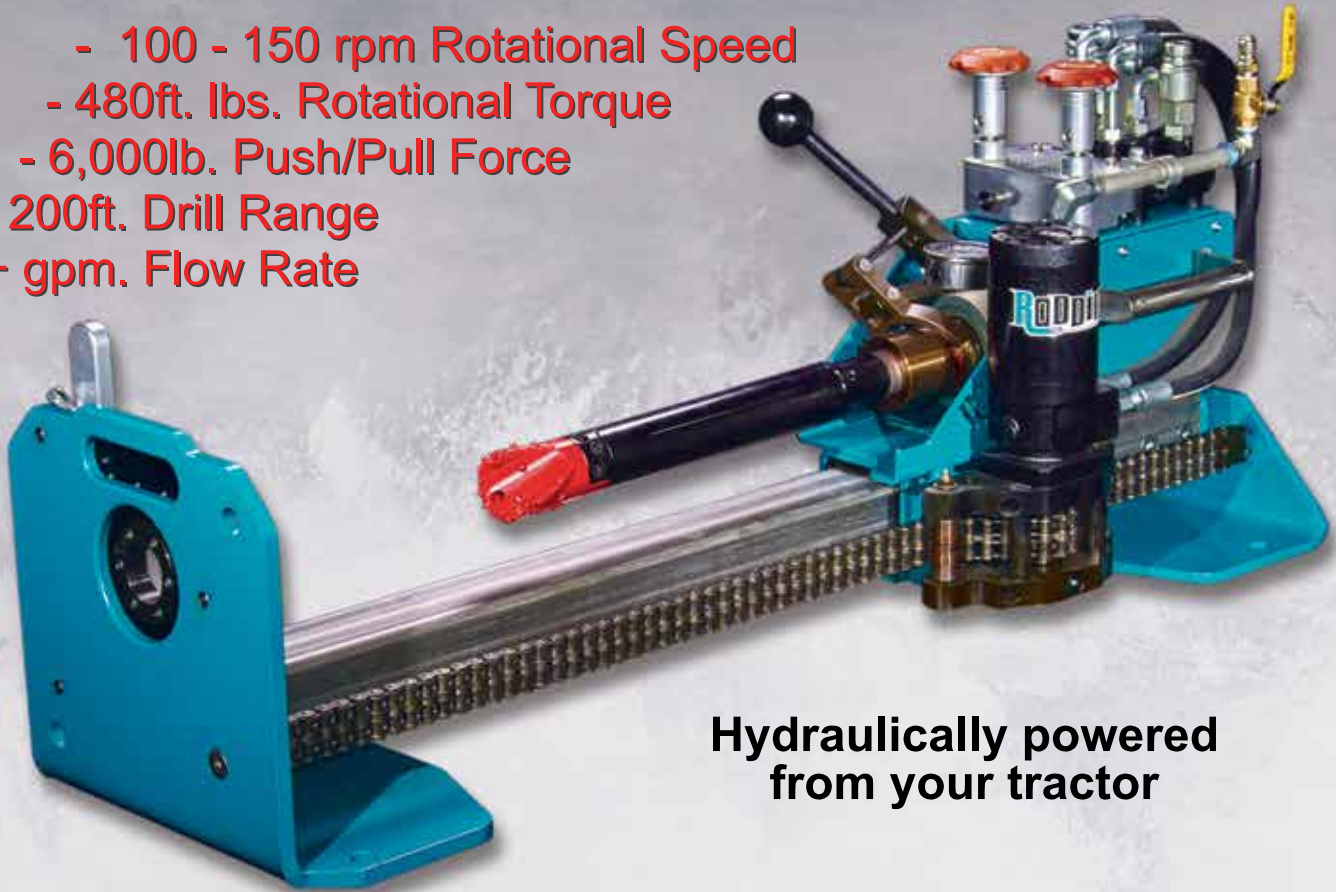
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Spearhead Locating Services owner Dave Marzio uses a vScan locator (Vivax-Metrotech) at a home in Ventura, California. Marzio founded his company in 2015, offering utility locating, CCTV, and aerial mapping to customers throughout the state. (Photography by Aron Eisenberg)

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ACCORDING TO THE COMMON GROUND ALLIANCE'S 2016 DIRT REPORT, THERE WERE **317,869 UTILITY DAMAGES** REPORTED IN THE U.S. AND CANADA IN 2016.

## Here's to a Safe Digging Season

**PICK UP THE PHONE OR LOCATOR, AND MAKE SURE YOU AND YOUR CREWS ARE AVOIDING THE UTILITIES**

BY CORY DELLENBACH

**A**s many of you know, April was National Safe Digging Month. It's meant to bring awareness to the importance of locating utility lines before digging.

Why should this be saved for only one month? It should be on our minds every day, all year. It isn't though. I often see stories about waterlines being struck and utility lines cut because the contractor didn't know where the utilities were in the first place.

Even the basic 811 and One Call services throughout the U.S. and Canada are better than going in blind and potentially putting you and your crews at risk.

### GOING ONE STEP FURTHER

One Call services are often required in many states, but some contractors are now taking it a step further and hiring private utility locating companies to conduct more in-depth locates.

One of those companies that is getting additional calls is Global GPR Services, profiled in this issue. The Ontario-based company was founded in 2007 by Steve Watson, who actually sold ground-penetrating radar units before realizing contractors were wanting the locates done rather than buying the units themselves.

Watson says he is satisfied whenever he finds a gas line or utility line before a trenching contractor digs into it with catastrophic results. However, he gets frustrated when his discoveries are ignored.

"Unfortunately, some contractors believe they know more than we do and go ahead and dig or pull up or cut a utility," Watson says. "They don't respect our findings. One contractor told me after cutting into a line that he just didn't believe it was where we said it was. He believed his drawings instead. The drawings were wrong."

Then there are the excavation companies that only call for the company's services after an accident has happened.

### SEEING THE NUMBERS

According to the Common Ground Alliance's 2016 DIRT report, there were 317,869 utility damages reported

in the U.S. and Canada in 2016. Those don't count the records that were input as "unknown" or "did not collect" in the field being analyzed.

Of those damages, 149,274 were caused by contractors who should've known there were utilities where they were digging. Backhoes and trenching operations accounted for 57,823 of those strikes, while 18,592 were by drilling operations.

Many of these situations could have been avoided with better utility locating methods. We won't know the number of utility strikes in 2017 until about midyear. Let's hope it's lower than the 2016 number.

### LOOK AT YOUR OPTIONS

It's time for you to look at your options and see what would work best — getting your own locating equipment or hiring private utility locators. Make sure you are thinking of digging safe every day you are on that job.

I'd like to know how you've made your company safer when it comes to utility locating. Email me at [editor@digdifferent.com](mailto:editor@digdifferent.com) or call 800-257-7222.

Enjoy this issue! ▼

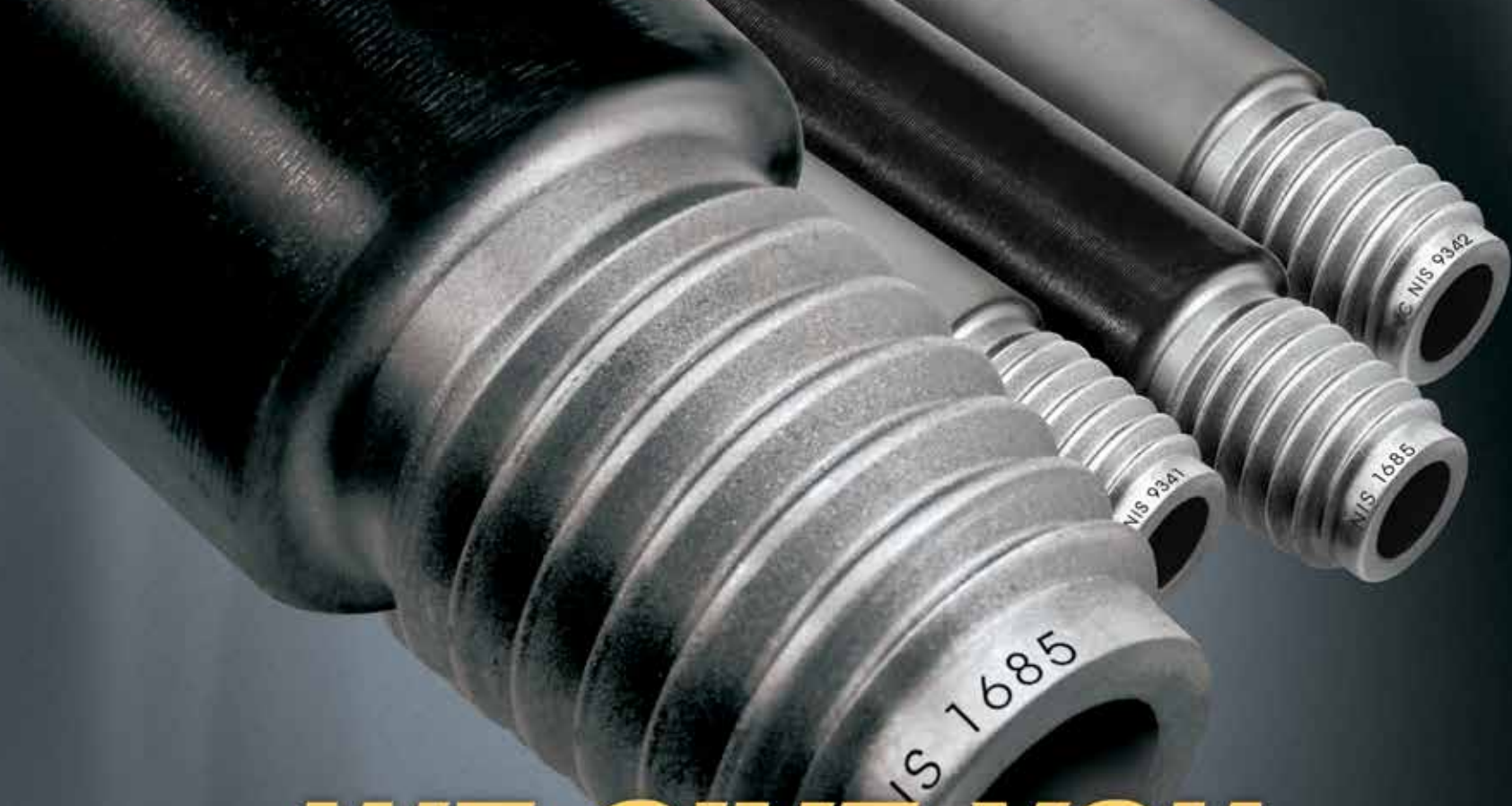
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There are countless good reasons to hire veterans at your company. Here are just a few of the benefits: They know what it means to have a mission, they excel at teamwork and collaboration, and they treat their responsibilities seriously. [digdifferent.com/featured](http://digdifferent.com/featured)

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While not a huge show floor, the No-Dig Show exhibit hall was still a draw to municipality workers, engineers and contractors looking for the latest in trenchless technologies. Tools like a universal pull head and a gyro navigation system for HDD can help contractors perform their work easier. [digdifferent.com/featured](http://digdifferent.com/featured)

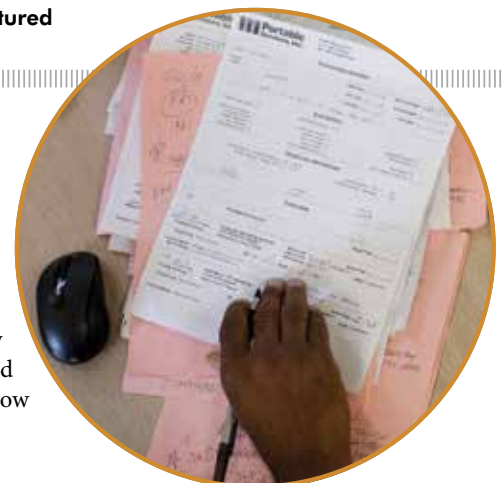
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"STARTING YOUR OWN COMPANY HAS ITS PROS AND CONS, BUT **IT'S DEFINITELY WORTH IT.**"

Dave Marzio



Spearhead Locating Services owner Dave Marzio (left) and Justin Van Fleet, owner of VTA DRONES, set up a drone for aerial mapping. The maps display utility line locations and allow for overlays illustrating additional information.

# FINDING A NEW PATH

## CALIFORNIA'S SPEARHEAD LOCATING SERVICES FINDS NICHE IN SERVING SOLAR INSTALLATION COMPANIES AND SEES GROWTH POTENTIAL

STORY: CORY DELLENBACH PHOTOS: ARON EISENBERG

**D**ave Marzio was getting burned out at his previous job as a manufacturing engineer. He knew he needed to make a change.

That change happened in 2015 when he decided to open his own utility locating business, Spearhead Locating Services, and run it as a one-man operation. "Starting your own company has its pros and cons, but it's definitely worth it," Marzio says.

The company, based in Ventura, California, offers electromagnetic, ground-penetrating radar, and CCTV services. Marzio has seen business steadily increase over the past three years and will be adding other services soon that will help the company continue to grow.

### A FRESH START

Marzio had been working in the manufactur-

ing industry for 30 years and knew it was time for him to try something on his own.

"A good friend of mine owns a horizontal directional drilling company and suggested looking into utility locating," Marzio says. "He was always looking for locators to find sewer laterals for his business since the city municipals don't locate them."

Marzio researched the industry and thought it was the right move for him. He earned the required training and certificates, including NASSCO training for sewer line inspection. He then opened Spearhead Locating Services in 2015.

"I bought all the equipment, and off I went," Marzio says. He secured work from his directional drilling friend to begin with and then, by word-of-mouth, got more work. "Now, I'm just bringing in new customers all the time."





Dave Marzio looks on as VTA DRONES owner Justin Van Fleet operates a drone for aerial mapping services at a home in Ventura, California.

## Spearhead Locating Services Ventura, California

**OWNER:** Dave Marzio

**SERVICES:** Utility locating, CCTV, aerial mapping

**SERVICE AREA:** Throughout California

**WEBSITE:** [www.spearheadlocating.com](http://www.spearheadlocating.com)



### GROWING SERVICES

When he first started the company, Marzio offered only electromagnetic utility locating and CCTV services. “I went with the ones that I needed for directional drilling work first,” he says.

The company added GPR services a year later, calling it another tool in the arsenal. Now Marzio uses both electromagnetic and GPR locators on jobs. With rocky soil conditions in California, the GPR unit can have limited results, but he still finds it a useful backup and often uses it to locate underground tanks.

“A lot of customers ask for GPR just because there’s a lot of materials that are not conductive,” Marzio says. “The GPR gets used all the time.”

For utility locating, Marzio uses vScan (Vivax-Metrotech), Pipehorn 800 (Pipehorn Utility Tool), and RIDGID SR-20 locators. The company also has a camera system from Hathorn for CCTV work.

“On most jobs, a push camera is all that is needed to locate sewer laterals, but on bigger jobs such as a gas line replacement throughout a neighborhood, the CCTV crawler is used,” Marzio says, “and for city sewer mainline inspections.”

### RAYS OF SUNLIGHT

A big piece of Spearhead Locating Services’ business comes from solar energy contractors installing large solar panels at private mobile home parks, schools and government centers.

“They’re installing carport-sized solar panels,” Marzio says. The solar arrays have 2-foot holes drilled up to 16 feet deep. “So where they are, drilling needs to be located. Then, most of the time they need horizontal drilling done to tie all the arrays together, so the bore paths have to be scanned for utilities.”

The public utility locators — through the 811 and One Call services — only locate up to the meters, leaving the rest to the private locators like Marzio. “The solar companies go far, anywhere from San Francisco down to San Diego, and I’ll travel anywhere they send me,” Marzio says.

While a majority of the company’s work comes from contractors,



Marzio attaches a locator to services outside a business. He founded his company in 2015, offering utility locating, CCTV and aerial mapping to customers throughout California.

Marzio is starting to see residential calls pick up thanks to his website. "I've been getting more residential calls to locate waterlines or gas lines," he says. "They tend to be smaller ticket jobs, but the volume of work more than makes up for that."

### TAKING TO THE AIR

Marzio is always looking for new ways to give his customers what they want. Over the past three years, he's learned that the majority of the properties he locates on do not have as-built plans.

**"MAINTAINING OUR HIGH LEVEL OF ACCURACY AND PROFESSIONALISM AS WE GROW IS OUR PRIMARY FOCUS."**

Dave Marzio

That brought Marzio together with Justin Van Fleet, owner of VTA DRONES in Ventura. The plan is to generate digital as-built plans for Marzio's customer base.

"The digital as-builts will be composite maps generated from drone flights above a property Marzio has located," Van Fleet says.

The maps will consist of hundreds of still images aggregated together into something similar to Google Maps, but with much more detail and with more zoom steps. The users will be able to zoom in close enough to see a coin on the ground, Van Fleet says.

The maps are then added into a free open-source software suite that Marzio and Van Fleet will provide the customers. The software allows for overlays to be added on top of the composite maps and forms to be associated with the features overlaid on the maps.

"For instance, color-coded lines can be drawn on top of the locating marks on the ground," Van Fleet says. "Then custom forms can be generated and tied to the lines. These forms can contain details about the specific utility lines, as well as pictures taken from a phone."

Once the map is generated, the user can access the maps from a mobile device or from a web browser. Using GPS on a mobile device, the user can navigate the property and find exactly where the utility lines are located.

"In the solar industry, the process of installation can take a very long time, more than a year in some cases," Marzio says. "Many times, the customer will have me go out and locate an area where they want the



## Not mixing signals

Dave Marzio is quick to mention both the vScan (Vivax-Metrotech) and Pipehorn 800 (Pipehorn Utility Tool) utility locators as his go-to pieces of equipment on job sites.

"The Pipehorn and vScan are really versatile pieces of equipment," says Marzio, owner of California-based Spearhead Locating Services.

The vScan offers a dual-frequency transmitter, data logging, option metal manhole cover detector, GPS and Bluetooth. The receiver offers 32 or 131 kHz active locate signals and passive signals for power, radio and cathodic protection.

"When you put it on the passive mode and you have a live line, the vScan does a great job of picking it up," Marzio says. "After you do a scan and find something, you can latch onto it with the transmitter and get a positive location on that line."

The Pipehorn 800 offers simultaneous conductive transmission of both high (480 kHz) and low (9 kHz) frequencies for congested areas and for long-distance locates.

"Those are my tools that I go to all the time," Marzio says.



Dave Marzio operates a ground-penetrating radar unit (US Radar).



Marzio started his company after working for 30 years in the manufacturing engineering industry.



“I’VE BEEN GETTING MORE RESIDENTIAL CALLS TO LOCATE WATERLINES OR GAS LINES. THEY TEND TO BE SMALLER TICKET JOBS, BUT **THE VOLUME OF WORK MORE THAN MAKES UP FOR THAT.**”

Dave Marzio

arrays to go, and depending on what I find, they may or may not stay in that location. Sometimes it’s six to eight months later before they actually drill. Many times I’m sent to re-mark the area.”

With the aerial mapping solution, the locations Marzio marks would then permanently be recorded and can be disseminated to all parties involved in the build process.

“We’ve been talking to some of my customers and they’re very interested in it because it puts everybody they are working with on the same page,” Marzio says. “They can look at their phones or computers at the same time and everybody can talk about the same thing and see exactly what is going on at the same time.”

#### EXCITED FOR THE FUTURE

With the addition of the mapping services via the drones and continuous calls for other utility locating services, Marzio says he’s looking forward to what his company will do in the future.

“This has really peaked my interest as far as where I can take this company,” Marzio says. “I have a feeling that once this gets played out and you can show customers exactly what we can provide them, I think this might be a good way for this company to go and focus on this type of work.”

Marzio has always had a goal of having three to five locators on staff who can go out and he can trust to perform quality locates. “That’s as big as I’d like to get,” he says. “I don’t want to let it get too large and to where I can’t control what is going on out there. Maintaining our high level of accuracy and professionalism as we grow is our primary focus.” ▼

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# Safety Is About Convenience

**FOR MANY OPERATORS, THEIR SAFETY DEPENDS ON WHAT THEY ARE GIVEN TO WORK WITH**

BY JARED RANEY

**W**hether you have one vehicle or 100, your operators spend nearly all their time in or around their service vehicles.

Often, whether or not an operator follows proper safety protocol hangs on how easy it is for them to do so. They perform these job duties every day, and it is easy to become complacent when safety means going out of your way.

That's why it's important to have proper safety gear as part of your everyday fleet or vehicle monitoring program. While some aspects of vehicle safety are required under Department of Transportation regulations, many are just good sense.

## FOR STARTERS

When it comes to DOT regulations, what's most important is researching and understanding exactly what is required for your specific service vehicle, as they don't all require the same gear.

For example, larger trucks often require fire extinguishers, and if you are hauling trailers or other equipment, the DOT specifies a certain grade of chain for securement.

"That's important for compliance; a lot of companies don't know that your chains have to be rated for all of the various equipment," says Eric Wright, vice president of safety for Northwest Cascade, a service company with over 300 service vehicles.

On a more basic level, most service vehicles are required by the DOT to carry reflective triangles or cones in case of roadside maintenance or accidents. Consider adding flashlights and emergency phones for those incidents as well, especially if operators are driving long distances regularly.

One of the many items a company should keep on its fleet vehicles for emergency purposes is a spill kit for fuels, gas, petroleum diesel, hazardous chemicals and battery acid.



PHOTOS COURTESY OF NORTHWEST CASCADE



A bag of supplies such as this, which includes a vest, hard hat, gloves, first-aid kit, safety regulations and glasses, is recommended for all vehicles in a fleet.

**"OUR NEWER TRUCKS ACTUALLY COME WITH AN ORANGE SEAT BELT, SO YOU CAN TELL IF THE DRIVERS ARE WEARING THEIR SEAT BELT OR NOT."**

Eric Wright

## BEST PRACTICE

It's a good idea to stock all vehicles with first-aid kits. First-aid kits are a universally applicable feature, which could be expanded depending on the service industry. They can be tailored to specific applications, such as adding an eyewash kit for workers around hazardous chemicals.

Bel-Art carries two mobile eyewash products — a larger version that can rinse both eyes simultaneously, in any orientation, and a smaller, 120 mL belt-pouch version.

"It's highly mobile. It's one-time use, but it's sealed, and it has a long expiration date," says Peter Yoo, product manager for SP Scienceware, parent company of Bel-Art. "So they can bring it wherever they need. The solution — it's great not just for physical dirt or debris, but also different things like acids and alkalis."

Northwest Cascade not only keeps first-aid kits on their vehicles, but also issues a personal first-aid kit to each operator.

The personal first-aid kit is part of a basic PPE bag that is provided. It also includes safety gear like a hard hat, two pairs of gloves, an orange vest, safety glasses (regular and tinted), headlamp, earplugs, and a safety regulations booklet.

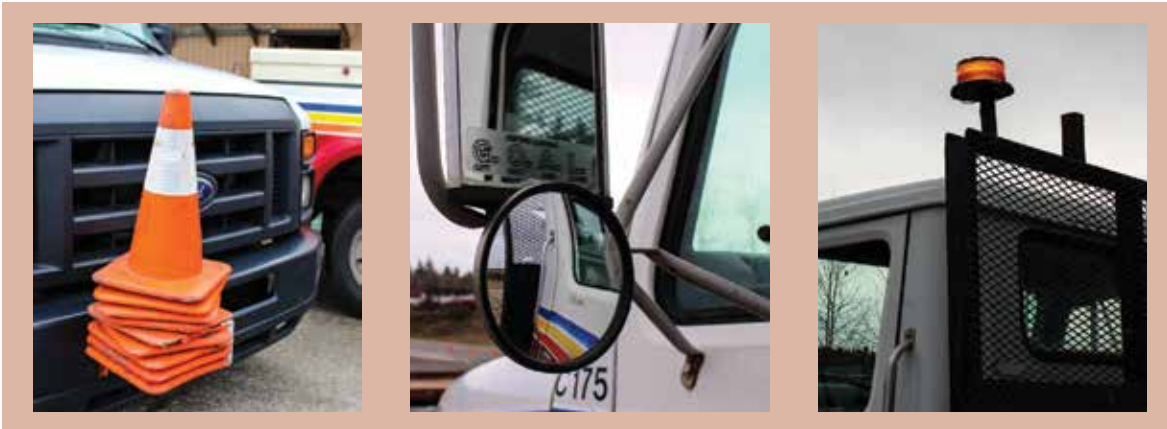
In many cases, it's not just providing the necessary equipment for operators, but making it as convenient as possible for operators to use that equipment.

Bel-Art offers an eyewear holder for safety glasses or goggles that can be installed in service vehicles. Other shelving units and organizational products across the market could be used for similar easy-access safety items.

## WORTH A TRY

Beyond the basics, there are many safety-enhancing additions for contractors to consider on their trucks.

Laws against cellphone and mobile device use are becoming more prevalent in states across the country, which makes Bluetooth and hands-free GPS options increasingly helpful.



FROM LEFT: Any fleet truck should have cones or road safety triangles ready if the truck breaks down. They should also be on the truck for any roadside work the company might be handling; Safety reminders in rearview mirrors keep employees thinking about safety; Emergency lights are recommended for work trucks as they catch the attention of passing motorists and caution them to slow down.

Northwest Cascade stocks spill kits on their vehicles in case of oil or other hazardous waste spills. “The spill kit we carry is just a company policy-type thing,” Wright says. “Same as the first-aid kit.”

Needs are different for every operation, but some outfits benefit from going toward the far end of safety precaution, as Northwest Cascade has done with the addition of dashcams.

The company’s dashcams are integrated into a vehicle monitoring system that also records hard braking, speeding and other driver habits that could affect safety. “It has parameters that you can set, so it ties in with the vehicle, what’s happening with the vehicle, as well as the driver,” Wright says.

Backup cameras are fast becoming a standard feature on both service and pickup trucks, but they may be something worth adding to older trucks as well.

Small things can make a difference too, like stickers in the cab and on the mirrors of service trucks. Those are reminders for the busy operator to observe common safety practices.

“On the newer trucks, obviously there’s lots of new safety features being incorporated,” Wright says. “Our newer trucks actually come with an orange seat belt, so you can tell if the drivers are wearing their seat belt or not.”

### WORTH CAREFUL CONSIDERATION

Safety shouldn’t be a throwaway checklist item for any company. That being said, every organization has its own needs, and owners should think carefully about what is best for the operators.

In the end, it depends on the specific industry, jobs that operators will be involved in, and frankly the operators themselves — the likelihood of any operator in question going out of their way to embrace safety.

All of these factors need to be considered when assessing safety protocol. The only thing that’s a certainty: There is no shortage of options. ▼

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# A SEAMLESS TRANSITION

CONTRACTOR GOES FROM SELLING GROUND-PENETRATING RADAR UNITS TO OPERATING THEM FOR UTILITY COMPANIES AND MUCH MORE

STORY: GILES LAMBERTSON PHOTOS: BRUCE BELL

Steve Watson sold ground-penetrating radar units for four years before he recognized that many customers needed companies to *do* the subsurface imaging more than they needed the equipment itself. In 2007, Global GPR Services was born. Today, Watson's company is kept busy searching high and low (mostly low) for utility lines, bedrock formations and, yes, bodies.

Global GPR Services' office is in Brampton, a suburb of Toronto, Ontario. England-born Watson moved as a child with his family to Canada and lives now in nearby Waterdown, north of Hamilton on the far west end of Lake Ontario. He entered the industry as a salesman for Sensors & Software, a 30-year-old GPR technology company headquartered in yet another Toronto suburb.

Because his background is in geological engineering, Watson's transition from equipment sales to service provider was seamless. "To be good at this work, you need to have a good technical background," he says, noting that GPR equipment companies sometimes forget that in their eagerness to sell their devices. "A tech

background definitely is best. Geophysics knowledge is an asset."

Possessing all of the above, Watson plunged into owning a business. With Sensors & Software's permission, he approached people who had contacted the equipment company about needing work done. He rented equipment from his former employer and quickly won a contract to scan the concrete floor of a retail unit facing excavation after a flood. Watson located the site's hidden utility lines and earned his first paycheck as a service provider.

"I knew there was a market out there for someone who understood the equipment and technology," he says. He still mostly employs Sensors & Software imaging equipment, and job and equipment referrals still flow back and forth between his company and his old employer.

## THE CUSTOMERS

Locating subsurface utility lines constitutes just a third of Global GPR Services' business, which is a bit

surprising given the hazardous profusion of underground lines in urban areas. The utility calls most often are from commercial clients. Even calls from homeowners usually originate with a contractor who has been hired by a property owner. Watson shies from purely residential clients.

“A challenge we have from homeowners is One Call,” Watson says. He refers to the governmental requirement that property owners contact a location company before digging on their property. The idea is to avoid burying tree balls on top of electric lines and such. “The first thing I tell the homeowner who calls is that we are a private company and we charge for our location services. The phone usually goes quiet at that point.”

While fees charged by Global GPR Services are not overly expensive, according to Watson, “In the eyes of homeowners, the fees are very expensive.” He basically charges an hourly rate that grows more favorable to a customer as a project lengthens, even when a work site is some distance from the home office. His business partner, Tom Maruya, is the company’s finance and accounting specialist.

What about underground treasure hunts? Watson was jokingly asked. Does he ever settle for a percentage of found treasure? “I never work for a percentage,” he says seriously, suggesting that the question has come up. Watson is tight-lipped about such searches, though he admits to having one on his radar that involves a long-lost artifact from the last century.

#### THE SCIENCE OF GPR

Beaming radio waves beneath surfaces to reveal what is hidden there is not a one-size-fits-all proposition. GPR scanning units basically emit signals and receive bounced-back sig-

**“I KNEW THERE WAS A MARKET OUT THERE FOR SOMEONE WHO UNDERSTOOD THE EQUIPMENT AND TECHNOLOGY.”**

Steve Watson



Don Johnston, technician at Global GPR Services, uses a Noggin ground-penetrating radar unit (Sensors & Software) to locate utilities on a job site in a field near Toronto.

## Global GPR Services Brampton, Ontario



**OWNER:** Steve Watson

**EMPLOYEES:** One full time, one part time

**SERVICES:** Utility locating, concrete scanning, geophysical survey, tank (UST) locating, police forensic locating, cemetery gravesite mapping, golf course subsurface mapping

**SERVICE AREA:** North America principally, globally as needed

**WEBSITE:** [www.global-gpr.com/ground-penetrating-radar.html](http://www.global-gpr.com/ground-penetrating-radar.html)



## Searching for snakes

Steve Watson considers himself an outdoorsman and naturalist. Being out in the field is one of the attractions of his work as founder and owner of Global GPR Services. Geophysical and environmental surveys not only are a big part of the company's business, they are personally satisfying to Watson — even at 40 degrees below zero.

That was the temperature when Watson undertook an environmental assessment on the banks of the Saskatchewan River near Burstall, a Canadian community of 450 people. His assignment was to locate a colony of prairie rattlesnakes hibernating in the ground. The snakes are an endangered species, so noninvasive exploration by ground-penetrating radar was the perfect solution.

To that end, Watson put on his winter duds and pulled a Sensors & Software Noggin 500 GPR unit across the frozen ground. Ground that is solidly frozen is not an impediment to such a survey, incidentally, though snow cover can be a hassle. One might ask: Why not walk the grounds at a warmer time of the year? The answer is that hibernating poisonous reptiles are not as apt to turn up underfoot in the dead of winter. "That's why we did it in the winter months. We didn't

want to contend with rattlers," Watson says.

The snakes don't dig the holes in riverbanks. They slither into and claim the homes of badgers and other burrowing animals. The lairs had been roughly located during a survey in warmer months, so Watson was directed to a specific area of about 15,000 square feet where his GPR unit could tell the subsurface story.

In the end, the hibernating spaces of roughly 300 prairie rattlers were identified, each snake an estimated 7-8 feet in length. The pipeline company that had contracted out the survey accepted Global GPR Services' findings, possibly with some reluctance: The pipeline had to be rerouted at a cost of \$14 million.

"We understand that we cannot just bulldoze through an area without first examining the area for animal inhabitants," Watson writes in a white paper on the project that can be found on the Global GPR Services website. "New practices and methodology must be used to maintain the balance in nature. Ground-penetrating radar is a nondestructive testing technology that is being used as a new practice and methodology in maintaining that balance."

And the methodology works at 40 degrees below zero, too.

nals that paint pictures. These reflected radio waves are analyzed in real time on a machine operator's screen and are stored for further data analysis. The effective depth of radar penetration varies greatly, from a few feet (seawater) to a few thousand feet (ice).

Watson's GPR machines produce signals ranging from 50 MHz up to 1,000 MHz. Essentially, the lower frequencies penetrate farther into a targeted mass. However, choosing the proper frequency is not that simple. "The higher the frequency, the shallower the depth of penetration. The lower the frequency, the deeper the penetration," Watson says. "But the other trade-off is that high frequency brings high resolution and low frequency is low resolution." Balancing and weighing these radio fre-

Global GPR Services owner Steve Watson says business doesn't slow down too much in the winter, as the company works with the police department trying to locate vehicles in the ice-covered lakes, along with other services.

**"NEW PRACTICES AND METHODOLOGY MUST BE USED TO MAINTAIN THE BALANCE IN NATURE. GROUND-PENETRATING RADAR IS A NONDESTRUCTIVE TESTING TECHNOLOGY ..."**

Steve Watson



PHOTO COURTESY OF GLOBAL GPR SERVICES



A technician uses a hand-held ground-penetrating radar unit while scanning within a cement portion under a bridge near Toronto. Global GPR Services was hired to inspect the rebar in the bridge to see its condition.



PHOTO COURTESY OF GLOBAL GPR SERVICES

quency characteristics are where training and expertise enter the picture.

The company's equipment includes a Noggin 250 (Sensors & Software) for utility locating and much of the company's other applications, Conquest (Sensors & Software) for concrete imaging, pulseEKKO PRO (Sensors & Software) for geophysical mapping, and EM Subsite locator (Ditch Witch).

The characteristics of the surface being scanned — earth, water, concrete, asphalt — must be factored in, as well as the depth and size of a targeted object. Sometimes these elements combine to frustrate a search. Failure happens, albeit uncommonly. "Absolutely, sometimes we don't find what we're searching for," Watson says. "All the subsurface imaging technologies have their shortcomings. There are only two pieces of equipment that will find any utility, and that is a backhoe and an excavator. There's no

exact science in locating something other than exposing it."

**"TO BE GOOD AT THIS WORK, YOU NEED TO HAVE A GOOD TECHNICAL BACKGROUND. GEOPHYSICS KNOWLEDGE IS AN ASSET."**

Steve Watson

One utility survey by Watson at a power transmission plant in California consumed a week, but 80 percent of Watson's utility searches are completed in two hours. That means his services are available for other kinds of searching, such as geophysical surveys. Those projects can involve mapping strata of bedrock in the path of a new sewer line so that a trenching

contractor can pick a best route for a line and bring in appropriate equipment. Geophysical contracts are attractive to Watson because they usually are for large acreage.

However, the single largest category of search undertaken by Watson's company is cemetery mapping. The cemeteries are what Watson calls "historical" graveyards, meaning the dedicated burial grounds have been around a long time. As a result, headstones have been knocked down or removed, and the human remains they once marked are left unmarked. To avoid opening gravesites where graves already exist, Watson is called to accurately map entire subterranean sections of cemeteries.

### DETECTIVE WORK

Speaking of bodies, Global GPR Services has found three so far for law enforcement departments. This can properly be called detective work as it involves detecting criminally hidden objects. Watson can talk about discovering the remains of a woman buried in a concrete floor or finding stashed money in the backyard of a drug dealer. Oddly enough, some of his successful forensic searches have been in cemeteries. Digging holes and mounding earth in a cemetery is akin to hiding things in plain sight.

Watson has a classic opening line in recounting a favorite true crime episode. "Three men were sitting in a bar," he says. "One guy was drunk and began to brag to the guy on the stool next to him that he had gotten away with killing a man." The third man at the bar, sitting on the other side of the drunk's new friend, turned out to be a retired police officer. The former officer's ears



Steve Watson, right, Global GPR Services owner, stands with technician Don Johnston. Watson founded the utility locating company in 2007 and also offers services in concrete scanning, geophysical surveying, tank locating, police forensic locating, cemetery gravesite mapping and golf course subsurface mapping.



pricked up as he listened to a drunken confession of murder and the secret of a murder weapon in the ceiling of an apartment.

“The police did their due diligence, and on a Thanksgiving weekend, the search began,” Watson recalls. In the apartment above where the man used to live, Watson was brought in to scan the poured concrete floor. His GPR equipment soon detected a handgun encased in the concrete. It turns out the man was an accomplished mason. After shooting his victim, he had chipped a hole in the ceiling of his apartment, wedged the handgun into the hole and expertly smoothed it over with new cement. Case solved.

### SATISFACTION IN FINDING UTILITIES

Such excitement is not an everyday experience at Global GPR Services, but the 61-year-old company owner said he is deeply satisfied whenever he finds a gas line or high-voltage power line before a trenching contractor or backhoe operator can dig into it with catastrophic results. The flip side is that Watson is frustrated when his subterranean discoveries are ignored.

**“UNFORTUNATELY, SOME CONTRACTORS BELIEVE THEY KNOW MORE THAN WE DO AND GO AHEAD AND DIG OR PULL UP OR CUT A UTILITY. THEY DON’T RESPECT OUR FINDINGS.”**

Steve Watson

“Unfortunately, some contractors believe they know more than we do and go ahead and dig or pull up or cut a utility. They don’t respect our findings. One contractor told me after cutting into a line that he just didn’t believe it was where we said it was. He believed his drawings instead,” Watson says. “The drawings were wrong.” When one contractor dismissed Global GPR Services’ conclusions and augered down into a 3-foot-diameter, high-pressure waterline, the ensuing eruption of water washed out a street intersection in about 15 minutes.

Then there are the excavation companies that only call for a GPR scan after disaster strikes. “Sometimes we are the last ones they call,” Watson says. “A couple of weeks ago, a contractor cut through a 600-volt supply line for a mall, shutting down the mall. We’re going out there tomorrow. He has more digging to do and doesn’t want to cut anything else.”

After a decade of exploring the unseen with penetrating radar, Watson has developed a tip or two for anyone wanting to get into the work. The first is to become educated about geology before taking a course on GPR and locating utilities. Being grounded in science and technology is essential. His other professional recommendation is to accurately source utility lines before search-



Steve Watson marks located utilities for a customer. His experience includes a decade of exploring the unseen in the ground and in the water.

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ing for them. “Go and locate where a utility line originates and start there. Even if it is outside the scope of your work, start from a known position when you can.” Reducing guesswork increases the chance of finding a hidden line.

For 11 years, his GPR carts have been rolled across the ground — or floated across water surfaces in his rubber dinghy — but Watson says the equipment is holding up well and reliably finding what it seeks. “I have about a third-generation of the GPR system, but it does the same good job as the day I bought it,” he says, noting that he has periodically updated the machines’ technology. “Are there better features in newer equipment? Absolutely. Would they help me do my job better? Probably not. With my education and experience, I can use the technology I have and get the job done very well.” ▼



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# Tip for Keeping Guidance Systems Tracking

## DAILY EQUIPMENT CHECKS AND CLEANING ARE BEST FOR THRUST BORING GUIDANCE SYSTEMS

BY MARYBETH MATZEK

**F**or utility contractors, knowing the right location to dig is vital. Thrust boring guidance systems play an integral role in helping contractors do just that.

The equipment, however, needs to be well-maintained to work properly so contractors receive an accurate picture of what's located underground, says Brian Kelly, president of Pow-r Mole Trenchless Solutions.

"It is like any other piece of equipment. If it is not in good condition, it will take longer to finish what you need to do," he says.

Examining the measurement tool to make sure it is accurate is the most important maintenance equipment check and should be completed daily or before each use. "A thrust boring guidance system measures distance, so you need to make sure what it is telling you is right," Kelly says. "When you're digging and you need to be at a certain depth — let's say 6 feet — you want to make sure that when the sensor says 6 feet, it's really 6 feet."

Double-checking the distance is fairly easy: If it says something is 2 feet, pull out a tape measure and make sure it's accurate. "You want to make sure the calibration is right; otherwise, it is garbage in, garbage out," Kelly says.

Here are a few other maintenance tips to help contractors keep their thrust boring guidance systems in tiptop shape:

### 1 KEEP IT CLEAN

Whether it is the steering heads, the transmitter, or the display monitor, the equipment should be cleaned after each use. Clean the screens on the receiver and remote display with a damp, soft cloth without cleaning agents, says Adam Hageman, sales manager with Universal HDD. As for cleaning the receiver, remote, and battery charger case, add a mild detergent to the soft, moist cloth.

Besides looking in obvious areas for dust and debris, Kelly advises contractors to check other places too, such as the springs in the battery component, since a poor connection can slow down the equipment.

### 2 CHECK FOR SOFTWARE UPDATES

Locators have pre-loaded software, and manufacturers make occasional changes to it, so check with the tool manufacturer from time to time to make sure nothing has changed. If it has, update the software on your tool since this will lead to better performance.

3

### CHECK THE BATTERIES

There are two types of batteries used in the guidance systems. One is rechargeable battery pack to power the receiver and remote display. Keep those batteries well-charged, and pay attention to how

long the charge lasts. For example, if a battery previously held a charge for 50 hours but now only lasts a day, it is a good idea to contact the manufacturer about a replacement.

The second type of batteries are located in the transmitters and are purchased at any retail store. "Make sure you buy high-quality ones since they last longer and you won't have to worry about replacements as much," Kelly says.

4

### KEEP AN EYE ON THE TEMPERATURE

Transmitters are usually equipped with an internal digital thermometer. The receiver normally has an icon showing a reading. Hageman says it is vital to watch that, and if the transmitter gets above 95 degrees F, take a break. The risk of damage to the transmitter increases dramatically above that temperature.

5

### HANDLE EQUIPMENT WITH CARE

This may seem like a no-brainer, but improper storage or handling of the rod string could affect how well the digital transmitter located in the housing at the front of equipment works, Hageman says. If that information is inaccurate, the project's success is in jeopardy. When done using the equipment, put everything away in cases and keep away from moisture and extreme heat or cold.

### LEAVE IT TO THE MANUFACTURER

While contractors can test or fix several components on their equipment, Kelly says there is one part they should leave to the manufacturers to handle: the locator.

"If you try to repair the locator yourself, the ramifications could be devastating," he says. "If you find the locator is not working properly, just go ahead and send it in. That's something you do not want to deal with." ▼



**"IT IS LIKE ANY OTHER PIECE OF EQUIPMENT. IF IT IS NOT IN GOOD CONDITION, IT WILL TAKE LONGER TO FINISH WHAT YOU NEED TO DO."**

Brian Kelly

# Take a Smarter Approach to Bidding

## CONTRACTORS RISK BRINGING TROUBLE TO THEIR BUSINESS WITHOUT A PLANNED APPROACH FOR TAKING ON MORE WORK

BY NEIL FELDMAN

**F**or contractors looking to expand, it may be tempting to significantly ramp up bidding output by firing off as many quotes as possible on various types of projects. But an overly zealous approach to taking on new business can easily backfire.

“It’s important to evaluate your business and have a clear direction where you want to take it,” says Jim Gaffney, owner of Goshen Mechanical in West Chester, Pennsylvania. “Taking on too much in a short period of time can put a lot of stress on a business and can lead to serious problems.”

Those problems could include not having sufficient labor to handle the work, taking on projects outside of your comfort zone, taking on projects with questionable clients, and impeding cash flow.

### WHAT TO CONSIDER

Prior to commencing a push to take on more work, contractors are well-advised to establish a clear strategy and approach to a ramped-up estimating effort. “There’s a lot to consider when determining what type of work to take on,” says Vitaly Kontorovich, owner of Vital Plumbing in Brooklyn, New York. “The first consideration is the type of labor being used. If you’re a union shop, you’ll never be competitive bidding nonunion work against open shop contractors, and so quoting those jobs is a waste of time for estimators.”

The next consideration is the size of projects you’re comfortable taking on.

“If you have a few employees and a bonding capacity of \$3 million, you can’t be looking at projects that will require a lot of capital and manpower,” Kontorovich says. “It makes good business sense to err on the side of conservatism to ensure you don’t bite off more than you can handle at a given time.”

Kontorovich notes that it’s better to have multiple smaller- to moderate-sized projects running simultaneously rather than managing one large one. If something goes awry or the money doesn’t flow as fast as expected on one project, it’s much easier to handle if there are multiple projects running.

The actual customers being quoted are another key consideration when looking to expand. “It’s important to run a Dun & Bradstreet report and have a good sense of the credit history of a prospective account,” says Bill Soper, senior estimator at Calvert Mechanical in Baltimore. If you’re on the fence about a particular new client, Soper suggests treading lightly by starting with a couple of small opportunities.

### THE BIDDING PROCESS

It’s relatively easy to get on a lot of bidders’ lists and in short order have more projects to quote than you can get to. Trying to estimate jobs too quickly,



**“IT MAKES GOOD BUSINESS SENSE TO ERR ON THE SIDE OF CONSERVATIVENESS TO ENSURE YOU DON’T BITE OFF MORE THAN YOU CAN HANDLE AT A GIVEN TIME.”**

Vitaly Kontorovich

however, can undermine diligent practices and result in costly mistakes. It’s important to allow ample time to review vendor quotes to ensure they are accurate and pricing is optimal. On projects where multiple manufacturers are noted as acceptable, estimators are well-advised to have at least two of them provide figures, especially on moderate and larger jobs where a lot of the same items are called for.

There’s a fine line between putting proposals together expeditiously and putting too many together too fast. “You don’t want estimators under so much pressure to churn out quotes that they end up making costly mistakes,” Gaffney says. “General contractors rely on competitive bids to win their work, so if they rely on a quote with a mistake, they will do whatever they can to hold you to that number.”

Gaffney notes that a couple mistakes with bids will quickly spread within the contractor community.

Following up on bids is nearly as important as submitting them. General contractors and end users are busy juggling many things at once, and quite often, those who are diligent with follow-up will be a top con-

tender when it comes to buying out that package. “Sometimes things get very hectic, and we are trying to purchase many different trades for multiple projects at the same time,” says Bill White, senior estimator and purchasing manager at Walsh Brothers, a Boston-based construction management firm. “I appreciate subcontractors who follow up weekly because it gets my mind thinking about that package, and I turn to that subcontractor when I need to ask questions or confirm scope.”

### STAYING ORGANIZED

Though it may seem like an obvious point, maintaining an organized bid schedule and updating it daily is extremely important. It’s easy to get caught up and neglect a handful of bids or begin reviewing certain bids the day before they’re due. By maintaining a schedule and adjusting bid dates as necessary, estimators can prioritize and focus on those jobs that are due sooner.

Lastly, it’s important to not take jobs below the margin threshold you’re comfortable with. “Just adding a lot of volume at tight margins is not a good approach,” Kontorovich says. “You need to have some cushion in it in case labor goes over budget or the money doesn’t flow as fast as you expected. You’re in business to make money and passing up bad jobs and jobs with no money in them is just as important as getting proposals out and negotiating good work.” ▼



# Proper Ground-Penetrating Radar Surveying Techniques

## TIPS AND BEST PRACTICES FOR GETTING THE MOST FROM YOUR INVESTIGATIONS

BY BRIAN JONES

**G**round-penetrating radar is one of the most accurate nondestructive testing methods available. To get the most from GPR surveying, it is essential to understand how GPR tools work and follow best practices when conducting surveys.

### KNOW YOUR TARGET CHARACTERISTICS

Before taking a single step in the field, investigators must determine the characteristics of the target they are looking for and the surrounding material they are imaging through.

Ground-penetrating radar travels at different velocities, depending on the material it is traveling through. For example, radar travels fastest through air (at about the speed of light) and slowest when traveling through water (at about one-ninth the speed of light). Radar velocity for all other materials will vary somewhere between air and water.

The value assigned to the GPR velocity through a material is called its dielectric. We use the dielectric value to calculate the radar velocity.

GPR equipment is looking for differences in the dielectric of the material, so surveying may be more difficult when two materials have electrical properties that are too similar. Users must assess whether there is enough difference between the target they are looking for and the target's host material.

When scanning concrete, operators may be looking for electrical and telecom conduits. These can be tougher to locate than metallic reinforcing steel, due to the slight variation in dielectric from the concrete and these targets (especially if housed in PVC pipe). A tip for overcoming this issue is turning the antenna 90 degrees from its normal orientation. Collecting data in this way may pick up different information, better allowing the operator to see plastic conduits, and give a better sense of concrete thickness. The same technique can work in utility locating and other layer mapping applications.

Electrical conductivity of the surrounding material affects how deep surveyors can see. Since GPR emits electromagnetic energy, it is subject to attenuation (natural absorption) as it moves through a material. If the energy is moving through a resistive (low conductivity) material such as very dry sand, ice, or dry concrete, the signal can penetrate a great deal of material. If a material is conductive (clay soil, wet concrete), GPR energy gets absorbed before it has had the chance to go very far into the material.



A technician from Ultra Engineering in Winchester, California, uses a ground-penetrating radar unit from Geophysical Survey Systems Inc. (GSSI) on a job site prior to excavating.

### CHOOSING THE BEST SURVEY DESIGN

After determining the target's electrical characteristics and the size, type, and orientation of utility lines, post tension cables, and objects of limited dimensions — including tanks and graves — investigators can design the survey.

If very high confidence is necessary, the survey design should be based on a bidirectional grid, with spacing between the lines equal to the smallest dimension of the targets. Where this is not possible due to obstructions, time, or budget constraints, the survey design should include a large overview grid, which would be followed by one or more smaller focused grids.

If looking for cylindrical objects like an old oil tank or buried drums, investigators should choose a bidirectional grid; these targets may look flat when scanned in one direction, so they can be easily missed or mistaken for a soil layer. Using a bidirectional grid would identify a cylindrical target if the surveyor sees a flat layer in one direction and a hyperbola/arch in the other direction.

For planar objects, including mapping the depth to bedrock, water table, or soil layers, the grid spacing would be determined mainly by the size of the

**OPERATORS SHOULD TAKE GREAT CARE IN SETTING UP THEIR SYSTEM FOR OPTIMAL PERFORMANCE ON EACH JOB. THERE ARE A VARYING NUMBER OF AVAILABLE SETTINGS DEPENDING ON THE GPR EQUIPMENT MODEL.**

area and allotted time, but one might also consider if there are any odd geologic features that need to be captured. These are typically larger features, and the undulating surface is a layer that can be seen by scanning in just one direction.

The survey design can use either 2-D or 3-D scanning. With 2-D scanning, individual profiles are collected and the data is often interpreted live on the screen. If the targets are utility lines or cables and they are in a known direction, it may make sense to do 2-D transects and mark them on the ground

as they are seen in the data. 2-D surveys are much quicker and easier, especially if surveying for one or two lines. They are also more effective if the survey is meant to locate geologic features, like bedrock or soil layers. Integration with GPS positioning is also quite common with 2-D surveys.

With 3-D scans, operators place a grid on the ground and collect information on parallel and perpendicular lines. Then, software in the field or office takes the individual profiles and models them together to get a top-down, bird's-eye view that's analogous to an MRI picture of the ground. A bidirectional 3-D survey is effective where the targets move in unknown directions. A 3-D grid is also a better idea if one requires a high level of confidence in a target's location or where a good visual image is needed for a report. 3-D surveys are also recommended if there are any potential dangers on the site that should be avoided.

Another issue that affects survey design is the operator's confidence in the target dimensions and how well the target boundaries are defined. If looking for the edges of a tank or trying to locate where a water table transitions, set the survey boundary properly to capture what is required at the survey site. Target dimensions and confidence level control the survey grid spacing used.

For example, if the target is linear, like utility lines, and the surveyor knows what direction the features are running, the surveyor should cross linear targets perpendicular to their orientation because they can be seen better. If this information is unknown, use a bidirectional grid.

To obtain this information, consult as-built plans, and look for site features that provide clues. For example, there may be similar manholes on both sides of the site, showing that the pipe runs from point A to B. Or, there may be water valve covers at regular spacing along the road that allow one to determine the pipe orientation.

## SELECTING THE CORRECT ANTENNA

Selecting the right antenna frequency for a GPR job depends on the size and depth of the target. A lower frequency antenna will provide deeper penetration, but the trade-off is that the targets must be larger to be imaged.

When looking only 1-2 feet beneath the surface, for example, when imaging in concrete and looking for very small reinforcing and conduits, use a higher frequency GPR antenna, which offers greater detail. For deeper targets, the

primary and secondary choices are lower frequency antennas. These allow users to see deeper, but one trades off the ability to resolve smaller features or targets.

When scanning utilities, the midrange antennas provide sufficient resolution to find 4-5 inch pipes. For going deeper, for example mapping geological features 40-50 feet deep, low frequency antennas will work because premium resolution is not required.

## BEST PRACTICES FOR SYSTEM SETUP

Operators should take great care in setting up their system for optimal performance on each job. There are a varying number of available settings depending on the GPR equipment model. The factory setup recall can be a great starting point. However, users may have to make adjustments to ensure they meet two of the most crucial parameters: selecting the proper depth and collecting the ideal number of scans per unit.

The proper number of scans varies depending on the size of the target and the soil or material one is working in. A smaller scan spacing (more scans per unit) slows down the survey, so it is best to collect as many scans as possible while maintaining an acceptable survey speed. However, some projects may require devoting the extra time needed for very small scan spacing.

More scans are required for smaller targets. For example, if the target is only 1 inch, take several scans per inch to guarantee getting a hit on the target. By contrast, if conducting geologic mapping looking for soil layers or the top of bedrock, one scan per foot or one scan per 6 inches would achieve the data density necessary to get the layer information required.

## NO SUCH THING AS TOO MUCH INFORMATION

Apart from equipment and settings, proper GPR surveying relies on information about the site. Gather everything available. Collect site plans and as-built drawings. Talk to site maintenance staff and those who know local geology. Get any available nearby boring logs and geophysical information. Consult websites that contain databases of water wells that have been cataloged.

These resources can assist with the expected location of buried targets and the depth at which the wells hit water table or rock. This information will provide valuable data points to use when setting up the system and conducting a GPR survey. ▼

## Tips and tricks to guarantee success

After carefully considering your target's characteristics, designing a study to maximize the likelihood of locating the targets and features you are investigating, selecting the right antenna for the depth you are surveying, and setting the equipment properly, there are a few more tips to keep in mind:

**Equipment** — Bring the proper equipment to the site, including paint, flags, stakes, and cones. For making grids that are required for 3-D scanning, make sure you have tape measures to create the grid. Don't forget to bring a basic tool kit (tape, wrenches and screwdrivers) to fix equipment on site.

**Visual site survey** — When arriving at a site, begin by doing a general visual site survey. Draw a site sketch, take photographs, and look for service features like manholes and valve covers.

**Look for ports** — For environmental surveys, look around the building perimeter for spill pipes, vent pipes, standpipes, or burial evidence. There is a port out there somewhere. Look for voids or depressions in the ground.

**Calibrate to known targets** — Do some preliminary depth estimates on known targets. Pop a manhole cover, drain, or catch basin. Drill a test hole down to the top of a piece of rebar in concrete.

Then measure down to get a point of reference. Scan right past that measured target and calibrate your equipment so the depth information for targets mapped on site is more accurate.

**Ensure proper power supply** — Make sure batteries are charged. If you are going to be out in the field for 12 hours, bring sufficient batteries. Batteries for most GPR equipment last only 3-5 hours, so bring extras for all-day scanning. If working indoors, bring an AC adapter to plug into the wall.

**Test in several areas** — Make sure there is not a lot of change in signal or the soil or concrete does not drastically change across the site.

**Document everything** — Good notes are extremely crucial, even for projects that involve only painting or marking. Take notes on system settings and prepare a site sketch. No one will remember exactly what he or she did in the field without written notes. It is especially crucial to have good notes and site photos if someone is collecting data and handing it off for analysis. These notes and post-survey photos can also prove very useful if a project ends up in litigation.

**Take good care of your GPR equipment** — Treat it like the sophisticated electronic that it is and you should get years and years of use out of it.



# Full Replacement

## CONTRACTOR USES PIPE BURSTING TO REPLACE PIPE AT CUSTOMER'S HOME AFTER LEARNING SEWER LINE WAS BROKEN

BY CORY DELLENBACH

A simple video inspection following a sewer line cleaning turned into much more than a contractor and homeowner expected. The problem required a full replacement of the sewer and waterlines from the city main to the house, as well as piping in the house.

"We were doing a video inspection of the line and found that the clay tile sewer line was broken," says Skooter Thompson, owner of Skooters Plumbing and Drain Cleaning. "We showed her the video live as we were doing it, and it showed she had some breaks in the clay tile where dirt and roots were coming in. We advised it would be a wise idea to replace her sewer before it collapsed completely."

It's not an uncommon problem in the company's service area — a 50-mile radius around Fargo, North Dakota. The company does about three pipe bursting jobs a month in the spring, summer and fall. In the winter, it slows down a bit because of the frozen ground, but the company stays busy with general plumbing service repair work.

"Most of our work is residential drain cleaning, sewer replacements and waterline replacements," Thompson says. "Most of the pipe we're replacing is clay tile, which seems to be what people are having issues with right now."

**"WE SHOWED HER THE VIDEO LIVE AS WE WERE DOING IT, AND IT SHOWED SHE HAD SOME BREAKS IN THE CLAY TILE WHERE DIRT AND ROOTS WERE COMING IN. WE ADVISED IT WOULD BE A WISE IDEA TO REPLACE HER SEWER BEFORE IT COLLAPSED COMPLETELY."**

Skooter Thompson

### GETTING TO WORK

Thompson and his staff discovered the problem at the Fargo home in October when they were called because of a slow drain. The crew cleaned out the line but wanted to find the cause.

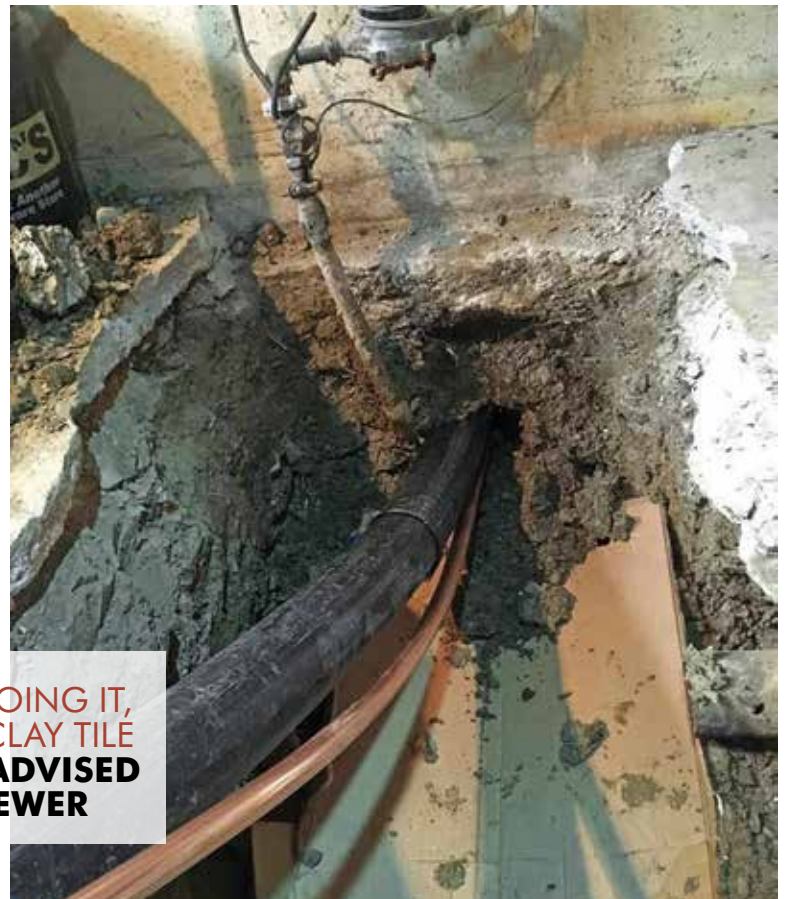
"Typically we get most of our jobs through drain cleanings," Thompson says. "A customer needs their drain cleaned, and after we get it cleaned, we scope it with a camera to make sure all the roots and intrusions are out."

After finding the breaks in the line, Thompson started to plan for the job ahead. Not only would the sewer pipe need to be replaced, but also a 1-inch waterline leading from the city service to the home.

"We called in our locates to find the nearby utilities and got our equipment staged," Thompson says. "We try to start our jobs on Mondays so we have the whole week to do them if need be, but most jobs only take three days."

(continued)

A PortaBurst PB30G2 system (HammerHead Trenchless) was used for the 95-foot-long pipe-bursting portion of the job.



**PROJECT:** Pipe bursting and repiping of home  
**CUSTOMER:** Private homeowner  
**CONTRACTOR:** Skooters Plumbing and Drain Cleaning, Fargo, North Dakota  
**EQUIPMENT:** PortaBurst PB30G2, HammerHead Trenchless, 800-331-6653, [www.hammerheadtrenchless.com](http://www.hammerheadtrenchless.com)  
**RESULTS:** 95 feet of pipe burst to install 4-inch HDPE fusible pipe in place of clay tile pipe, installed a 1-inch copper waterline and installed PEX pipe throughout the house

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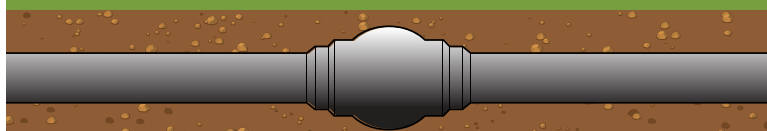
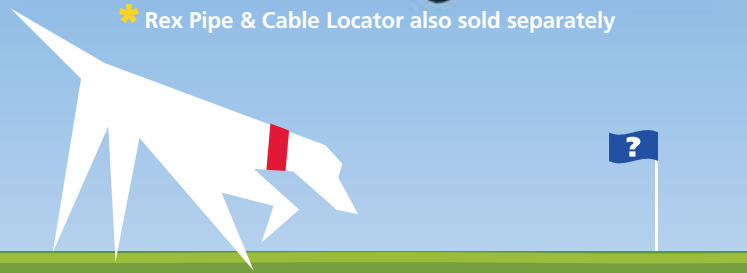
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Both the copper waterline and the HDPE sewer line enter the basement of the home as they are pulled back through the old pipe.



The entry pit for the pipe bursting job in Fargo, North Dakota. Skooters Plumbing and Drain Cleaning handled everything from the excavation to the pipe bursting, including patching up the road and basement.



A technician from Skooters Plumbing and Drain Cleaning in Fargo, North Dakota, prepares for the new waterline and sewer line to enter the house. Crews installed a new 1-inch copper waterline and a 4-inch HDPE sewer line.

On the first day of the job, crews got the street dug down 11 feet using Case Construction backhoes and wrapped the basement for the interior work. The second day was the pipe bursting and installation of the new pipe.

The Skooters Plumbing and Drain Cleaning crew removed an old lead waterline and replaced it with a 1-inch copper line. Crews then replaced the old clay tile sewer line with a 4-inch HDPE fusible pipe. “We also installed a new clean-out and backwater valve inside the house, eliminating any possibility of the sewer backing up from the neighbors,” Thompson says.

The pipe bursting portion was about 95 feet long. Thompson says a PortaBurst PB30G2 (HammerHead Trenchless) was used on the job. Typically the pipe bursting and installation takes one full day. The third day is then used as a clean-up and inspection day.

### MORE WORK INSIDE

Not only was work needed on the outside of the home, but inside work was also required.

The home had galvanized waterlines throughout, so crews replaced both the hot- and cold-water lines with PEX. “It’s a big timesaver and money saver for the homeowner, using PEX,” Thompson says.

Some cast-iron pipes above ground were also replaced because of leaking issues in the house.

### FINDING A NICHE

Thompson founded his company in 2005, saying he was tired of working for somebody else. He knew early on that he wanted to have drain cleaning as a service option for customers.

“I was subbing a lot of it out to another company in town,” Thompson says. “There’s only one other company in town that has equipment to do trenchless sewer and water replacement. I decided I would purchase the equipment and do it myself.”

**“ANOTHER PLUMBING COMPANY MIGHT COME IN AND OPEN THE DRAIN, BUT WE’LL COME IN AND THOROUGHLY CLEAN IT ALL OUT.”**

Skooter Thompson

From May to December 2017, the company did about 1,100 feet of pipe bursting. Thompson has made his company a one-stop shop for customers.

“We handle everything from start to finish: the street cutting, patching, the backfill, all the excavation, all the removal of concrete from inside the house,” he says. “There are no other subcontractors in the house; we’re the only ones there from start to finish.”

Thompson says his company works with other plumbers in the area who don’t offer drain cleaning services or sewer replacements.

“We have different equipment than most,” Thompson says. “Most plumbing companies use drum-style snakes, but we use a sectional machine because it has the ability to do a lot better job in cleaning. Another plumbing company might come in and open the drain, but we’ll come in and thoroughly clean it all out.”

The company has three K-1500 sectional machines (RIDGID). They also use General Wire jetters.

Skooters Plumbing and Drain Cleaning was called in to assist another plumbing company this past summer after a subcontractor for the city put in a light pad and drove the ground rods through the sewer. The other plumbing company had come out but could not get the sewer cleaned enough to see what happened.

“We were able to come in, clean it out; and that’s when we saw the ground rod through the sewer,” Thompson says. “We located it and had the subcontractor come over to verify it.”

Thompson takes pride in being able to do work that others may not be able to handle. “It is challenging work,” he says. “But it’s a good feeling when you finish up the job and the customers’ homes are back working again.” ▼



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BY CRAIG MANDLI

## Air Excavation Equipment

### Ditch Witch Air Saber

Rated for operation at 250 psi, the Ditch Witch Air Saber empowers operators to dig faster and more efficiently on a variety of utility installation projects. Its innovative design increases airflow for users while maintaining safe operation. A spring-lock, quick-connection system prevents the air hose from inadvertent separation, supporting project safety, while the body is constructed from nonconductive material, also improving operator safety. The ergonomic, full-hand squeeze trigger is comfortable and easy to use. It is compatible with the FXT Air Series along with other air excavator models on the market.



800-654-6481; [www.ditchwitch.com](http://www.ditchwitch.com)

### Ox Equipment MTS GmbH Dino Suction Excavator

The MTS GmbH Dino Suction Excavator, distributed in North America by Ox Equipment, powerfully excavates without the use of water, eliminating issues related to slurry disposal and overweight loads. It uses a twin fan system that generates over 24,000



cfm of suction power. The large, 10-inch suction hose, which is precisely manipulated via a fully mechanical power arm, deploys off the rear of the unit for increased versatility. Functional side-tipping allows for fast, efficient and easy dumping from the 10.5-cubic-yard spoils container, either directly on site or into roll-off bills, allowing the unit to stay on site all day, effectively doubling productivity.

888-290-4044; [www.ox-equipment.com](http://www.ox-equipment.com)

## Electronic Utility Locators

### McLaughlin Vermeer Verifier G3

The Vermeer Verifier G3 utility locator from McLaughlin combines precision with a user-friendly interface. It includes a combination peak and null screen, semiautomatic and manual gain adjustment, automatic depth and current measurement index, and compass icon. Users new to the locating profession will appreciate the streamlined design and simple interface, while advanced operators have the option to capitalize on advanced locating technology.



800-435-9340; [www.mclaughlinunderground.com](http://www.mclaughlinunderground.com)

### RIDGID A-Frame Fault Locator

The RIDGID A-Frame Fault Locator finds the location of ground faults in direct buried insulated wire up to 2 megohms. It can find faults up to 3 miles away from the transmitter and up to 20 feet below the ground, depending on conditions. It has a durable, lightweight powder-coated frame and weatherproof membrane buttons. It provides a reference readout to aid in fault location. It is composed of two elements: The FT-103 Transmitter and the FR-30 A-Frame



Receiver. The transmitter operates at 797 HZ – “dFF” displayed and has an output power of up to 3 watts with low, medium and high settings. The FT-103 Transmitter connects to an insulated conductor to establish a current flow. The current travels to the ground and back to the ground stake via an insulation fault. The FR-30 Receiver detects the current flow and gives audio and visual directions to locate faults.

800-769-7743; [www.ridgid.com](http://www.ridgid.com)

### Schonstedt Instrument Rex

The Rex pipe and cable locator from Schonstedt Instrument is a multi-frequency locator for all underground utilities: water and sewer, electric, telecom, and gas. The design of the transmitter is less than 2 inches thick and weighs less than 4 pounds. The pistol-grip receiver extends for greater sensitivity and retracts for easier carrying and storage. Both the receiver and transmitter fit into a custom shoulder bag. A Multi-Purpose Combo Kit is also available, with a GA-92XTd magnetic locator and a multi-frequency pipe and cable locator.



800-999-8280; [www.schonstedt.com](http://www.schonstedt.com)

### Subsite Electronics UtiliGuard

The UtiliGuard utility locating system from Subsite Electronics uses ambient interference measurement to automatically scan the surrounding area for noise and recommend the best frequency among 70 options. To help users make more accurate locates of obstructed utilities, it measures distances (depth) both horizontally and vertically to the utility. To ease use, the system has an intuitive, six-button, multilanguage operator interface and a high-contrast LCD display to ensure visibility in all conditions, including direct sunlight. A dual-output feature allows users to connect the transmitter to two utilities at once, and the system is Bluetooth-enabled to simplify data transfers. Its rugged housing with an IP65 rating protects against dusty, dirty and wet conditions, and it has 100-hour transmitter and 30-hour receiver battery life.



800-846-2713; [www.subsite.com](http://www.subsite.com)

### Vivax-Metrotech vScan

The vScan utility avoidance tool from Vivax-Metrotech was designed to make buried utility detection a simple and cost-effective process. It offers seamless data logging and a compass line direction indicator standard. Options include GPS, Bluetooth and a buried metal cover mode. Its main features and operational controls are in line with industry standards, so minimal training is required.



800-446-3392; [www.vivax-metrotech.com](http://www.vivax-metrotech.com)

## Hydroexcavation Equipment

### Easy Kleen Pressure Systems Wildcat Heaters

Wildcat Heaters high-pressure, oil-fired hot-water/steam heaters and hydraulic pump systems from Easy Kleen Pressure Systems are reliable, efficient and install-ready for vacuum trucks and hydroexcavators. A full range of heater options are available, such as dry steam, redundancy packages, Schedule 80 and 160 stainless steel or A53 boiler pipe, fine-tuned temperature, and flow control systems. All coils are manufactured in-house, with CRN boiler-approved coils now available. Heaters can be designed for mounting in a



cabinet or supplied as a completed cabinet unit that is ready to install. They are CSA- and ETL-approved.

800-315-5533; [www.easyklean.com](http://www.easyklean.com)

### GapVax HV33

Designed for city use, the GapVax HV33 is shorter, smaller and more compact than its predecessor. It is designed to safely transport water and debris in urban areas. It is 30 feet long overall on a medium-duty chassis and includes a 600-gallon water tank, 6-cubic-yard debris body, a 14- to 17-foot 6-inch boom in 8 or 6 inches, 4,000 cfm of power, and an inverted fully opening tailgate.

888-442-7829; [www.gapvax.com](http://www.gapvax.com)



### Hurco Technologies hydroexcavation vacuums

The 250- and 550-gallon hydroexcavation vacuums from Hurco Technologies use quality components to provide maximum performance in a compact trailer or skid. They are ideal for smaller jobs to avoid needing to pull large vacuum units from other projects and for accessing delicate terrains or tight areas, such as golf courses and parks. The fully opening hydraulically powered door allows for easy cleaning, and the fixed-angle tank eliminates numerous maintenance and wear issues that arise with hydraulic-lift tanks.

800-888-1436; [www.hurcotech.com](http://www.hurcotech.com)



### Hydra-Flex Ripsaw

The Ripsaw rotating turbo nozzle from Hydra-Flex blasts a 0-degree water stream at up to 3,200 psi while rotating at a high speed to provide an 18-degree cone of coverage. Its cone-shaped flow pattern is ideal for potholing applications. The heavy-duty, high-impact nozzles are constructed with stainless steel housings and tungsten carbide wear surfaces to withstand harsh environments and provide long life. Repair kits are available for extended life and lower operating costs. Select from traditional coating (blue) or upgrade to the heavy-duty coating (green), a formulation designed for use in extreme environments. Greater impingement allows users to complete jobs faster or use a smaller nozzle size while getting the same impact as nozzles with higher flow rates.

952-808-3640; [www.hydrflexinc.com](http://www.hydrflexinc.com)



### NozzTeq MONRO-JET

The MONRO-JET hydroexcavation nozzle from NozzTeq combines the power of a solid-stream pencil jet with the large coverage of a fan jet. Its circular water jet motion generates tremendous power at modest gallons per minute rates, allowing the operator to move faster whether hydroexcavating, surface cleaning or cleaning sewer lines. It can be used for other types of surface cleaning such as concrete, steel, castings and large surface areas including line removal from runways. It can be modified for internal pipe cleaning of sewers and pipes of all types. An orbital design increases performance at a lower gallons per minute rate and pressures as high as 36,250 psi.

866-620-5915; [www.nozzteq.com](http://www.nozzteq.com)



### Ramvac by Sewer Equipment HX-12

The HX-12 hydroexcavator from Ramvac by Sewer Equipment has a 12-yard debris tank and a temperature-controlled environmental chamber that contains the entire water system, including water tanks. A directional discharge

system allows the operator to off-load debris back into the excavation site when finished, without the mess of dumping the tank. This system also allows operators to blow any obstructions out of the dig hose. It includes a long-range wireless remote, NEMA 4 electrical system, a 900,000 Btu water boiler and a three-stage cyclonic filtration system. The standard 4,400 cfm blower delivers fuel economy. It is available with a RamAir air excavation system touting a 185 cfm at 150 psi air compressor for when the operator can't risk adding water to the problem area.

877-735-4640; [www.ram-vac.com](http://www.ram-vac.com)



### Rival Hydrovac

The Rival Hydrovac was designed to competitively excavate utilizing water and vacuum, but to do so in a smaller package that would remain street legal when loaded. It can be filled with debris and driven, eliminating the risk of tickets and liability exposure to the operator and contractor. In doing so, it gives the owner reasonable capacities and a highly efficient, yet simple system.

844-467-4825; [www.rivalhydrovac.com](http://www.rivalhydrovac.com)



### Soil Surgeon hydroexcavating tool

The Soil Surgeon hydroexcavating tool fits any sewer combination truck equipped with a telescoping 6- or 8-inch boom. The tool has a 1-inch water connection. The operator controls water pressure and power-through truck controls. It has a 6-foot Tuff Tube with handles to guide the unit down for potholing or side to side for trenching. Six jets boring inward cut the soil, while six boring outward bring the tube down.

949-363-1401; [www.soilsurgeoninc.com](http://www.soilsurgeoninc.com)



### StoneAge HXR-300 Rotary Hydro-X

The HXR-300 Rotary Hydro-X nozzle from StoneAge uses an angled rotating jet pattern that's designed to decrease jet dwell time and reduce undercutting for effective work around utilities. Users can save labor hours and heavy-equipment costs, all while avoiding the risk of damage to buried utilities. It is fully rebuildable, allowing the operator to reduce cost of ownership by extending the life of the tool with minimal, low-cost maintenance. There are three jetting options available for a variety of applications: higher flow for harder surfaces, intermediate flow for general use, and lower flow for water savings. It handles pressures up to 5,000 psi and flow rates from 3.5 to 10 gpm.

866-795-1586; [www.stoneagetools.com](http://www.stoneagetools.com)



### Super Products Mud Dog 1200

The Mud Dog 1200 12-yard-debris-capacity hydroexcavator from Super Products has a rear-mounted boom capable of a 19- to 27-foot reach, 335-degree rotation, 45-degree upward and 25-degree downward pivot. This range of boom motion allows crews to achieve greater work area access and deeper digging without halting production to reposition the trunk. Easy-to-use ejector plate unloading technology provides fast, thorough and safe removal. A tilt-unloading feature ensures liquids in the debris tank are cleared quickly and efficiently, even when unloading in an up-slope/nose-down position. Options include the Acculevel load-sensor system for precise debris tank level measurement.

800-837-9711; [www.superproductsllc.com](http://www.superproductsllc.com)



(continued)



### Supervac Atlas

At 33 feet, the Atlas hydroexcavation trailer from Supervac offers the compact versatility of a regular vacuum



truck, with a high payload capacity of 45,000 pounds. It is easy to maneuver with its tight turning radius and solves road weight limit issues. It comes equipped with a flashing arrow and LED working light, full-opening rear door, protection arm and LED light, a hydraulic door lock, 3,600-gallon carbon-steel debris tank and baffle, and a catwalk access ladder and handrail. Its six side-mounted and evenly distributed plastic water tanks (three on each side) have a total capacity of 1,500 gallons. It runs off the chassis engine of the tractor being used to haul the trailer. The unit's top-loading boom offers 320-degree rotation, extension of 25 feet, an 8-inch flex hose, top access door and protection elbow. A winterization package is available.

866-839-5702; [www.supervac.co](http://www.supervac.co)

### Tornado Global Hydrovacs F4 ECOLITE

The F4 ECOLITE from Tornado Global Hydrovacs has a 12-cubic-yard mud tank and holds 1,400 gallons of freshwater. This unit is over 7,000 pounds lighter than the company's older models and offers nearly triple the payload. The boom has a 342-degree rotation and a 26-foot reach. The F3 ECO-



LITE is a 10-cubic-yard, 1,200-gallon water tandem-axle unit that also more than doubles older payload capacities. With an 8-inch boom and a 3,800 cfm blower, although smaller, it's still robust and powerful.

877-340-8141; [www.tornadotrucks.com](http://www.tornadotrucks.com)

### Transway Systems Terra-Vex HV38

The Transway Systems Terra-Vex HV38 has a 12-yard debris tank with onboard scales, which allows a driver to load the tank worry-free. It includes a large debris tank for those light loads, saving time and money, complete with a 26-foot-by-8-inch telescopic boom.



It has a simple one-touch-operated hydraulic half-door with a 3,800 cfm at 27 inches Hg hydraulically driven blower. Water pressure is achieved with a hydraulically driven triplex pump, delivering 10 gpm at 3,600 psi from a 1,000-gallon HDPE baffled water tank. The water is heated with a 420,000 Btu diesel-fired burner for cold weather operation.

800-263-4508; [www.transwaysystems.com](http://www.transwaysystems.com)

### Vac-Con X-Cavator

The X-Cavator from Vac-Con is powerful, durable and easy to operate. It comes fully loaded and features a hydrostatic drive that uses the chassis engine for the vacuum, creating a more efficient system that eliminates the need for PTO, clutch and gearbox operation. It is available with water systems up to 4,000 psi and a mobile, wireless remote-control system that enables the operator to work the chassis engine revolutions per minute, boom, automatic vacuum breaker, dump controls and hydraulic door locks from remote areas up to a 1/2 mile. The boom rotates up to 270 degrees.



904-284-4200; [www.vac-con.com](http://www.vac-con.com)

### Vacall - Gradall Industries AllExcavate cold weather package

Vacall - Gradall Industries offers a step-in compartment on its AllExcavate hydroexcavators to provide operators with warmth and protection from inclement weather. The standard heated compartment is roomy, with enough space for an operator to change out of wet and muddy boots and clothing. The compartment has floor drainage, racks to hang dry clothing and another rack to store the high-pressure hand gun and extensions. Even larger compartments with extra room are available. Along with new LED lighting, the cold weather package includes extra insulation, heated cabinets for the hose reel and water pumps, and boilers that can heat water for more effective hydroexcavation in frozen ground.



330-339-2211; [www.vacall.com](http://www.vacall.com)

### Vactor HXX QX

The Vactor HXX QX vacuum excavator offers improvements in payload capacity, weight distribution, operation and performance. The truck maximizes legal payload for customers and improves operational efficiency. The placement of the debris body and water tank on the chassis ensures equal distribution of the payload on the axles, regardless of how much water is in the tanks. Each component is purposely placed to ensure the entire chassis gross vehicle weight rating is used. A PrecisionFlow water pump features a single-piston design. The truck comes with a QuietPak sound-damping system with a Robuschi USA positive-displacement blower rated for 6,176 cfm and 28 inches Hg. The system delivers higher airflow and quieter operation, with a decibel rating of less than 90 dBA throughout the revolutions per minute range. It has a Park-N-Dig quick operation design, which reduces setup and tear-down time between jobs, and a 7-inch display with real-time operational and performance information feedback.



800-627-3171; [www.vactor.com](http://www.vactor.com)

### Westech Vac Systems Wolf

The Wolf noncode hydrovac truck from Westech Vac Systems is ideal for oil and gas customers working in extreme conditions. The debris body is positioned on the optimal spot of the chassis to ensure the payload is proportionately distributed across all axles simultaneously, maximizing legal payload for customers and improving operational efficiency. The side-mounted water tanks reduce the weight by more than 40 percent, lowering the overall cost of the truck. The 1,500-gallon capacity ensures ample water storage capacity for large or remote jobs. A top-mounted, no-touch water fill system is easily accessible from the passenger side of the vehicle. The debris body is lifted using a telescoping, dual-acting hydraulic cylinder capable of 36,000 pounds of force. When fully extended, the debris body exceeds a 45-degree dump angle for fast and efficient off-loading. To help the off-loading process, a heavy-duty, hydraulically powered tank vibrator is mounted to the belly of the debris body.



780-955-3030; [www.westechvac.com](http://www.westechvac.com)

## Leak Detection Equipment

### RKI Instruments GX-6000

The GX-6000 from RKI Instruments simultaneously monitors up to six gases, including combustibles, oxygen, carbon monoxide and hydrogen sulfide. Two smart sensor slots accept PID, IR or other toxic gas sensors. It includes an internal sample pump, man-down and panic alarm, LED flashlight and large auto-rotating LCD display. It operates as a single-gas PID unit or a multifunctional tool utilizing all six channels. The PID sensor comes equipped with a library of over 600 VOC gases and can personalize a favorites list of 30 commonly used VOCs, as well as a list of eight of the most recently used VOCs. A benzene-specific PID sensor is also available.

800-754-5165; [www.rkiinstruments.com](http://www.rkiinstruments.com)



## Mapping

### CUES GraniteNet

GraniteNet condition assessment software from CUES is asset-based, which enables the software to easily interface with other asset-based software products such as Esri ArcGIS mapping systems and asset management systems to include Cityworks, Infor, IBM Maximo, and others. Intuitive and easy to use, the data and video can be accessed via a web portal.

800-327-7791; [www.gnet.us.com](http://www.gnet.us.com)



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# THE LATEST: Products



1

## 1. Volvo Construction Equipment ECR355E short-swing crawler excavator

The Volvo Construction Equipment ECR355E short-swing radius excavator is designed for more confined spaces. Powered by a 241 hp Volvo D8 Tier 4 Final engine that combines high torque and low revolutions per minute for more horsepower and torque, it is equipped with an X-frame undercarriage built with forged steel top rollers and rugged boom arms for sustainable uptime. Wide-opening compartment doors allow unobstructed ground-level access to maintenance points, including pump pressure taps, filters, and the cooling package. Auto Idle and Auto Engine Shutdown features, as well as integrated work modes, allow for an exact amount of power and controllability. **828-650-2000; [www.volvo.com](http://www.volvo.com)**

## 2. Gorman-Rupp ValuPrime line of centrifugal pumps

ValuPrime priming-assisted, centrifugal pumps from Gorman-Rupp are ideally suited for dewatering needs and are based on the Prime Aire and Prime Aire Plus lines. The pumps come in 4-by-4-inch and 6-by-6-inch sizes, flows to 1,520 gpm, a total dynamic head to 150 feet, and solids handling capabilities up to 3 inches. **419-755-1011; [www.grpumps.com](http://www.grpumps.com)**



2

## 3. Komatsu America PC238USLC-11 hydraulic excavator

Komatsu America's PC238USLC-11 hydraulic excavator is equipped with an EPA Tier 4 Final certified engine, and a new viscous fan clutch reduces parasitic load for increased productivity. KOMTRAX and the monitor panel deliver machine data for easy monitoring and quick operator action. Exhaust gas recirculation was added to reduce NOx emissions, and the SCR catalyst does not require scheduled maintenance and is designed to match the life of the engine. Selectable, auxiliary hydraulic control option provides one-way and two-way attachment flow in the monitor panel, with adjustable flow control. **847-437-5800; [www.komatsuamerica.com](http://www.komatsuamerica.com)**



3

## This Issue's Feature:

### Add revenue with downhole tooling

BY CRAIG MANDLI

Pipeline and utility companies are now, more than ever, looking for contractors that have the capability and expertise to do more than simply excavate to install or expose underground infrastructure. The ability to make repairs and perform maintenance without tearing up large swaths of infrastructure is the ideal solution but can sometimes be difficult. Fortunately, tools are available to perform those tasks.

In recent years a construction technique known as keyhole technology has evolved from the combined development of vacuum excavation, pavement coring and custom downhole tooling development. The **small-hole tools** manufactured by **Tellus Underground Technology** are specially engineered, long-handle devices designed to give utility professionals an ability to perform maintenance and repair tasks without the high cost and safety risks that are inherent in traditional open-trench methods. Similar to the process of microsurgery on the human body, these tools facilitate standard maintenance and repair processes on underground utility lines using less in-

vasive methods than the conventional techniques employed in large excavations.

"Our product lines include power tools such as long-handle saws, grinders, drills, and ratchets, as well as hundreds of specialized hand tools and pressure chambers designed for working on live underground distribution systems," says Frank Russo, president of Tellus Underground Technology. "These keyhole tools have evolved from industry knowledge and tooling designs that provide the capability to perform tasks a few feet below ground while standing above the excavation."

Keyhole technology provides the contractor with an opportunity to expand the services they can offer to their customers, thus expanding their business opportunities with existing customers.

"Doing more business with the customers you already have is always the fastest and easiest way to expand a business and is definitely more profitable than prospecting for new customers," Russo says. "Keyhole processes such as leak repairs, service cutoffs, corrosion control and service

Small-hole tools from Tellus Underground Technology



renewal have historically been an important type of product offered to the pipeline and utilities companies by the largest contracting firms. But using our tools, any contractor has the ability to offer keyhole technology."

The tooling products are supported with specific operating procedures, and Tellus Underground Technology provides all standard maintenance and repair procedures necessary to keep the tools in operation.

**570-234-0325**  
**[www.tellusunderground.com](http://www.tellusunderground.com)**



4



7



8



5



#### 4. Vermeer D8x12 Navigator horizontal directional drill

Vermeer's D8x12 Navigator horizontal directional drill is a compact drill sized for working in tight spaces, such as power, water and telecommunication networks. The D8x12 is equipped with a 48 hp Kohler diesel engine and offers 1,000 ft-lb of spindle torque and 7,850 pounds of thrust/pullback. It features basic hydraulic pilot joystick controls with essential electrical components, simplifying operation and routine maintenance. With low noise emission level of 85 dBA and guaranteed sound power of 104 dBA, the drill is suitable for working in urban environments. Two drill options are available for versatility. **641-628-3141; www.vermeer.com**

#### 5. Cat Pumps Model 3560 water pump

The Cat Pumps Model 3560 is a high-pressure water pump with two performance ratings: 25 gpm at 3,000 psi and 20 gpm at 4,000 psi. The pump is ideal for equipment operating in high-duty cycle/remote applications, such as hydroexcavating and jetting. It can be direct-driven hydraulically or pulley-driven from motor or engine. Other features include V-packings and low-pressure seals completely lubricated and cooled, which greatly increase pump life. No external oilers are required. The discharge manifold is constructed from 316SS for high strength and long life in demanding applications. The manifold is easily serviced without entering the crankcase. It is available from stock for immediate shipment. **763-780-5440; www.catpumps.com**

#### 6. KINSHOFER USA NOX-Tiltrotator Series tiltrotators for excavators

NOX-Tiltrotator Series tiltrotators from KINSHOFER USA offer 360-degree continuous rotation and tilting angles of up to 2 by 55 degrees. The tiltrotator features an elliptical piston rather than a cylinder for a streamlined design and high-power performance in a variety of tight areas and applications, such as road construction, general construction, and city snow removal. The cylinderless design provides a narrower tool that can move more freely in tight spaces without hang-ups, enhancing efficiency. The unit's minimal service requirements limit downtime. An optional electric swivel is available with integrated sensors. **800-268-9525; www.kinshofer.com**



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#### 7. Vac-Con Titan Class combination machine

The Titan Class truck-mounted, dual-engine combination machine from Vac-Con features enhanced twin cyclonic separators, one located on each side of the truck, for optimal efficiency and filtration. The Aero-boost three-stage fan balances airflow, resulting in less turbulence and more power. The water system features 1 1/4-inch plumbing and ball valves. Upgraded hydrostatic and auxiliary drive systems that operate the vacuum and water functions lower noise emissions and reduce overall fuel consumption without sacrificing power. **904-284-4200; www.vac-con.com**

#### 8. MB Crusher trommel-screening attachments

MB Crusher manufactures a line of seven trommel-screening attachment models for excavators and loaders, regardless of brand. Screen material with one excavator or loader. The product line begins with the smallest loader screening attachment, the MB-LS140, designed for skid loaders weighing more than 5,800 pounds and has a load capacity of 0.5 cubic yards, to the largest excavator screening attachment, the MB-S23, designed for excavators weighing more than 77,200 pounds and has a load capacity of 5.6 cubic yards. They are designed to screen natural material, such as quarry residue, dry soil, and river stone, to be reused at the job site. The innovative attachments give contractors a versatile tool to navigate through narrow spaces and manage on-site processing, ultimately reducing the time it takes to complete a job and create immediate fill and base material. **855-622-7874; www.mbamerica.com** ▼



## CLASSIFIEDS

### EQUIPMENT & TOOLS

2013-2015 Kenworth T800 Vactor hydro-excavators. 12-yard debris tank. 20gpm. Extending boom. Miles and hours vary. Multiple trucks for sale. Dave 530-682-0804, CA (C05)

2007 Sterling Vactor 2100PD tandem-axle combination cleaning truck. Ex-city owned, well maintained, and equipped with California Carb Compliant DPF System. See details of this unit and other cleaning and CCTV inspection units at [www.empire-equip.com](http://www.empire-equip.com). Contact Craig at 714-639-8352. (CBM)

Recycle Jet Vac for Sale: 2015 Kenworth T880 w/Cummins ISX15 engine, 32,900 miles. 1,500-gallon stainless steel water tank, 10-yard stainless steel debris tank. 590 ft. 1-1/4 hose on rotating reel; 325 ft. 1/2 lateral hose. Uraca P3-45-70 Triplex water pump, 125gpm/2,175psi. Email [MHughes@gapvax.com](mailto:MHughes@gapvax.com) or call 888-442-7829. (C07)

FOR SALE: Two (2) Andritz 2.2-meter belt presses, unused after complete refurbishing to Andritz factory specifications. Dyer Equipment Co. 970-454-3784, Ault, CO or [dyerequipment@aol.com](mailto:dyerequipment@aol.com) (P05)

1998 Vactor 2103 Jet/Combo. Good shape. City owned. \$35,000. 605-359-1786 (C06)

2007 Sterling LT7501/Vactor 2115 combination sewer cleaner. Hydroexcavation capable. \$60,000 OBO. Call or text 317-710-7542 for pictures and details. (P05)

1999 International Guzzler vacuum excavator: Totally refurbished, purchased new for Big Dig Project. 27" blower, CAT engine, auto remote. Special noise-suppression equipment. Tri-axle. High-pressure wash-down system - 300-gallon water tank. \$59,500 OBO. Also available 1997 Ford Guzzler vacuum excavator - same features as 1999 International. No washdown system. \$59,500 OBO. Call 617-908-1629. (CBM)

Jack Doheny Supplies Inc. offers a full range of late model combo units and DOT industrial vacuum loaders. Call us @1-800-3DOHENY. (PBM)

### RENTALS

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

## THE LATEST: News

### Ditch Witch announces updated Parts Lookup online tool

Ditch Witch has released an advanced version of its Parts Lookup tool. It provides easy access to detailed parts information and a direct line of communication to dealerships for part verification and pick-list creation. Parts Lookup can find service parts by serial number, part name, equipment model or keywords. All equipment in a company's fleet can be added by serial number for easy reference to manuals, parts diagrams and future service parts needs.

### Vermeer and Mincon announce distribution agreement

Vermeer and Mincon announced that they have formed a distribution alliance to expand access to rock tooling worldwide. As part of the agreement, Vermeer dealers are the exclusive channel for Mincon hori-

zontal directional drilling air hammer systems, pull reaming hammers, and support equipment, including HDD support stations and oilers.

### Geophysical Survey Systems Inc. (GSSI) announces launch of new website

GSSI announced it launched its newly redesigned website. It features a helpful and easy-to-use product configurator, quick access to the training class calendar, and all the latest news and updates, including the most recent case studies and videos. ▼

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"There are different ways to excavate soil. Most people think you're just spraying water on the ground, but it's a science — there's a right way to do it.

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Mike Morehouse, Owner  
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# Happenings

## CALENDAR

**May 22-24**

**National Utility Contractors Association (NUCA) Washington Summit**, Holiday Inn Capitol, Washington, D.C. Visit [www.nuca.com/summit](http://www.nuca.com/summit)

**June 3-6**

**American Society of Safety Engineers (ASSE) Professional Development Conference & Exposition**, Henry B. Gonzalez Convention Center, San Antonio. Visit [safety.asse.org](http://safety.asse.org)

**June 3-6**

**Electric Utility Fleet Managers Conference (EUFMC)**, Williamsburg Lodge and Conference Center, Williamsburg, Virginia. Visit [www.eufmc.com](http://www.eufmc.com)

**June 24-27**

**North American Tunneling Conference**, Washington Marriott Wardman Park, Washington, D.C. Visit [www.natconference.com](http://www.natconference.com)

**Sept. 29-Oct. 3**

**91st Technical Exhibition and Conference (WEFTEC)**, Ernest N. Morial Convention Center, New Orleans. Visit [www.weftec.org](http://www.weftec.org)

**Oct. 23-26**

**EquipmentSHIFT**, Renaissance Columbus Downtown Hotel, Columbus, Ohio. Visit [www.aemp.org/page/shift2018](http://www.aemp.org/page/shift2018)

**Nov. 1-2**

**WJTA - IMCA Conference & Expo**, Ernest N. Morial Convention Center, New Orleans. Visit [www.wjta.org](http://www.wjta.org)

Dig Different welcomes your contributions to our Happenings column. To recognize members of your team, please send notices of new hires, promotions, service milestones, certifications or achievements. We also invite your national, state or local associations and organizations to post notices, news items and learning opportunities. Send contributions to [editor@digdifferent.com](mailto:editor@digdifferent.com). ▼



## Seeing Red?

Do you have a question about maintenance on a piece of equipment? Dig Different can track down the answer for you in our **Machine Shop** feature. Send us your question and it could be a future column.

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