VOLUME 30 ISSUE 2

The American Locator

by UNDERGROUND FOCUS

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page 28

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A View from the Streets

What is the American Locator?

By Matt Streets, Editor
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Well, the American locator is simply you: the reader holding this magazine. We created this periodical for people in the utility damage prevention industry. And our role here is to deliver stories that are helpful, useful and informative to you.

Before I started working in this industry, I knew absolutely nothing about utility locating. I would look at paint marks on the pavement the same way as graffiti or a chalked out hopscotch grid. It was just more visual noise to fade into the background of everyday life.

Once I began down this path however, and started talking to people in the business, I started to see the full scope of what utility locating entails, and even more importantly, the huge role of safety and damage prevention.

I am now here to do my absolute best to fulfill and live up to that responsibility, to bring you informative features, to share the knowledge I've found, and to expand our collective awareness of damage prevention to better improve all aspects of our industry.

To that end, I think we have some great articles for you in this issue!

First, check out our revamped Accident File, now *Digging Dangers*, for some examples of what can happen when utility locating and excavating mistakes are made, including a bizarre incident where a locator struck a gas line with a grounding rod! We bring these vivid and sobering reminders to you to show some of the life and death decisions that are made every day in this industry.

Next, you can jump over to our profile of Kemp Garcia, a veteran locator and excavator with nearly 25 years of experience in the field. Kemp also works with one-call centers and safety councils, making his well-rounded views and opinions invaluable to any discussion of damage prevention.

Also, be sure to check our interview with Mississippi 811 Executive Director Sam Johnson, perhaps the only one-call director out there with an illustrious college football career under his belt!

Finally, for a real eye-opening and smoke clearing look at the locating world and all things GPR related, be sure to read our articles on Dennis Prezbindowski. Most people in the damage prevention world come from similar areas of the industry. Whether they were trained as locators, or worked in the excavation or utility industries, or even at a one-call center, the pedigrees of most people can be easily traced to a few sources. For geologist, teacher and GPR expert Prezbindowski however, he arrived in our world from a different path: the sphere of science. His decades of study and work in examining the subsurface, in both academic and corporate settings, have lent him a unique perspective on the underground locating world which he was kind enough to share with *The American Locator.*

Why Planet Underground TV?

Simply put: we believe that we can reduce damages by sharing with you what we learn from the specialists and experts in the underground utility industry. We are extremely excited to be launching this video arm of our enterprise with the premiere of Planet Underground TV in August! Our opening episode has tons of great stuff, including a segment on the talented excavating crews and locators from utility construction company, INTREN. Watch these professionals in action as they pothole, locate and bore in utility lines while hearing in their own words the obstacles and challenges they face every day out in the field.

Building off of the "Changing the Game" article from the last issue of *The American Locator*, we'll also take a fascinating look at the history of the Metrotech 810 locating instrument, as well as a compelling interview with Fred LeSage from XL Catlin Insurance about damages at dig sites. And future episodes will profile some great stuff from Dennis Prezbindowski, another visit with our INTREN crews, a talk with the minds behind HBK Engineering and more! This is just the beginning folks, so be sure not to miss it!

I am very excited to begin this new journey, and hope you will come along with me as we learn about and explore this fascinating industry together. I am also eager to hear your stories and share them with the rest of the world, so please don't hesitate to contact me if you feel you have something important to say. Remember: increased knowledge and awareness leads to better safety and security. And I think we can all agree that is a goal worth striving for.

Above: Shooting footage of a horizontal directional drill in action.

Right: The INTREN crew from left to right: Jim Wright, Joe Seng, Chad Balmer, Mike Seng, Mike Underwood.

Below left: Fred LeSage from XL Catlin Insurance

Below right: The original Metrotech 810 transmitter from 1981.

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How Things Work

Live Wires and Dead Zones: Talking GPR—Ground Penetrating Radar—with Dennis Prezbindowski

How important is it to have knowledge of utilities for getting good results with GPR?

Having an understanding of how utilities are constructed is a very important knowledge base that an experienced GPR operator needs to develop or have prior to becoming a skilled GPR locator. Interpreting GPR image scans becomes easier with knowledge of utility construction practices. I recommend that all GPR operators, if possible, take a look at utility targets that they have imaged after they have been day-lighted, or have pictures taken and sent to them after the job is completed.

GPR imaging can never positively identify a target in the subsurface with 100% certainty. Since you are dealing with an image generated by reflected pulsed EM signals, many types of subsurface structures including utilities can have similar reflection signals. GPR targets and anomalies need to be day-lighted to confirm their identity.

How important is it to have standard electromagnetic (EM) locating instrument knowledge for getting good GPR results?

Well-developed, EM locating skills are a must for any successful utility locating professional. However, we know that there are numerous circumstances in which the most proficient EM locator cannot locate certain types of utility lines, like non-conductive utilities with no associated conductive tracer wire. Fortunately, the skill characteristics of a good EM locator are very similar to the skills required to be a good GPR imager. These skills are that GPR locators must be good observers of site conditions, and noticing origins and logical termination points of utility lines. They need to have a good basic understanding of how utilities systems are constructed. They are curious and have a drive to solve problems. And finally, they must also understand that EM utility locating is a very important tool to characterizing a utility system, but like every tool it has its limitations.

GPR is a powerful complementary tool to EM locating that uses EM energy to image utilities and many other subsurface features in a different way. You no longer need a conductive utility or associated tracer wire to locate a utility line since that is not required by GPR.

Is there any quick, relatively simple way to train people on GPR, or does it take years of experience to become adept at using GPR?

An individual can be taught how to use the newer GPR instruments in a relatively short period of time. However, becoming a good GPR locator requires extensive hands-on operating experience. The more experience a GPR operator has, the better his GPR image and interpreting skills will become. I have found that GPR locating skills cannot be effectively taught in a class room setting, but must include early on field work under the guidance of an experienced GPR operator.

Can you tell us a little about GPR in general and explain what the main differences are between GPR and EM locating?

GPR is a technique that uses very small, very rapid pulses of electromagnetic energy to image the subsurface and other solids such as concrete walls. The GPR and EM instruments both use EM energy. GPR works with frequencies in the megahertz (millions of cycles per second) range, while the EM locating instrument works with frequencies in the kilohertz (thousands of cycles per second) range.

The pulsed radio waves from GPR are directed downward into the subsurface as an expanding wave front. Like a flashlight beam in a dark room, a GPR antenna does not generate a perfectly cylindrical beam. The pulsed beam tends to spread outward as it moves downward through the substrate. As this spreading occurs there is less and less EM energy to reflect off a target of a given size and shape at greater depths. Remember this coning process of the EM pulses also occurs to the reflected return signal from your subsurface target.

"No area should be condemned as being totally unsuitable for GPR scanning based on one failed attempt or hearsay."

The GPR instrument is basically an echo-type of instrument that measures the time it takes for EM pulses to travel from a sending antenna to an interface of two materials in the subsurface that have different EM properties. This contrast in EM properties causes a percentage of the transmitted EM pulse to reflect back to the GPR receiving antenna. Its signal strength and two-way travel time is recorded by the instrument. Individual return signals from each pulse sounding are combined with many individual pulse soundings as the GPR instrument advances across the surface of the site. The ground position is then recorded for each pulse sounding. When combined, the reflection profiles form an imaged GPR depth profile of the reflective structures/targets in the subsurface across which the GPR instrument is moved. The beauty of this technique is that it can image through many subsurface materials noninvasively and does not require a conductive media to carry a signal, like a tracer wire.

Are there any misnomers about GPR that you'd like to clear up?

There are numerous misnomers about GPR, many of which are the result of quick judgements made by individuals that have little understanding of GPR. I will give two examples: First, that certain soils are not conducive to GPR imaging so do not even take the GPR out to the site. Even in highly conductive soil systems GPR can be incredibly useful in locating subsurface utility lines. Many utility lines are trenched in and it is common practice to fill the trench with material other than the native soil. If this fill material is better drained than the native soil then the GPR may not only image the utility lines but also the original utility trench system. Secondly, the idea that soil conditions do change throughout the year and some imaging projects can be better accomplished during the dry season. Areas that have wet, conductive soil conditions during a rainy period can be better imaged with a GPR during a dry period. No area should be condemned as being totally unsuitable for GPR scanning based on one failed attempt or hearsay.

Which type of soil generally provides better GPR results and why?

Unlike EM locating, where conductive soil conditions can improve locating efficiency, GPR imaging can be significantly degraded by the increased conductivity of the soil. High soil conductivity is generally caused by the increased presence of water.

The simple explanation is that the energy of the higher frequency GPR pulses—relative to EM locating instruments—can rapidly bleed off into the surrounding conductive soils. This will result in a reduction in the effective imaging depth of a GPR instrument. This reduction in effective investigation depth of a GPR instrument can be very significant and may result in the inability of a GPR instrument to image common utility lines.

As a rule of thumb, a lower frequency GPR system suffers less conductive loss in wet soil conditions than a high frequency GPR and can thus image deeper. But in general, based on my experience, the best GPR imaging is likely to occur in dry sandy soils.

One of the most important observations that a GPR operator can make at a project site is the determination of the effective imaging depth of the GPR instrument for the frequency being used. Also remember that the effective GPR imaging depth can vary significantly across a site as soil conditions change.

When arriving at a dig site, how do you go about determining soil types before you start locating?

It is important to have some knowledge about the soil and soil covering materials like concrete or asphalt at a proposed site prior to conducting a GPR survey. As a simple

rule of thumb, the more resistive a soil or covering material, the better the GPR imaging survey will potentially be, with deeper and improved imaging. Unfortunately, a GPR operator does not always have this information prior to conducting a GPR survey. A quick visual inspection of the proposed survey site and a few test GPR scans across various surface materials like concrete, asphalt and different soil types, can provide an easy assessment of the potential of conducting a successful GPR locate.

How important is it to have knowledge of different soil types when GPR locating?

Knowing soil conditions will allow the GPR operator to determine the likely, maximum depth for successfully imaging utility targets in the subsurface. For example, if you're attempting to image a bored in utility line in a soil that only allows the return of a usable GPR signal from a depth of approximately 3 feet, you are unlikely to be able to image this utility line if it was installed at a depth greater than 3 feet. However, if the utility was installed in the bottom of a trench you might be able to image the utility line at a greater depth because the backfill material may be better suited for GPR imaging (less conductive) than the undisturbed soil around the filled trench.

What is important to know when attempting to determine utility line depth with GPR?

The speed of the GPR signal can vary significantly between different soil types and weather conditions. Depth is not determined directly by the GPR instrument, but is calculated from two-way travel time (the time it takes for the GPR signal to travel to the target and then back to the receiving antenna) multiplied by the actual GPR signal velocity in this particular soil type. The GPR depth determination is only as good as your understanding of the velocity characteristics of the soil, and this velocity can vary widely at a site.

As a rule, I do not recommend providing depth determinations of any GPR imaged utilities. For example, a GPR determinate depth for a utility target in a filled trench system might be significantly wrong because the GPR velocity of the trench filling material may be significantly different than the surrounding soil material in which you have calibrated your GPR instrument when determining the average two-way travel GPR soil velocity at your site.

Talk to us about the "dead zone."

The "dead zone" that you refer to is not really a "dead zone", but rather a very short time window in which the return GPR signal (reflected GPR signal detected by the receiving antenna) is dominated by surface reflections from the air/ground interface and direct air waves versus high quality GPR return signals from the subsurface. A GPR instrument provides the best reflected image when it has the ability to use a series of clean individual pulses. The wavelength of a single pulse depends on the frequency and speed of the material it is traveling through. If a target is significantly shallower than the length of a single GPR pulse, your reflected signal will be of lower quality and may not be resolvable.

A GPR is a ground coupling instrument, meaning the antenna should be in direct contact with the surface of the ground. Since a GPR antenna is a precise metal component, it is protected inside a sealed antenna case. This case is further protected with a base, plastic skid plate to protect the antenna case from excessive wear as it is slides along the ground. I have found this characteristic of GPR imaging is not a significant issue, especially if you use a combination of high frequency and low frequency scans of the area.

Any final thoughts or things about GPR you'd like to get out there?

Yes, for instance, TV shows misrepresent radar in the sense that it gives the impression that it can do all things, and this drives me nuts, because it contributes to this misunderstanding of radar. It can't do all these things that TV says it can, so it leads to this false idea that it can do everything. Being able to image a gravesite and seeing who the person is that's buried down there, well that would never happen, you just can't do that. If someone out in the field sees a person running a radar unit, and sees what it can image, they'll say something like, well this doesn't look like anything I've seen on TV, so it must not be any good.

While Dennis doesn't like everything he sees on TV, we think you'll like seeing Dennis this fall on Planet Underground TV. Also, be sure to check out our follow up interview with Dennis featuring a more technical-based look at GPR imaging in the next issue of The American Locator.

Excavation Safety

Digging Dangers: Exposed!

Fiery explosions, huge plumes of black smoke, and the squawking chatter of emergency responders are just a few of the vivid sights and sounds that open this latest installment of the *Digging Dangers* series of videos. This chapter stresses the need for vacuum excavating to physically locate all underground pipes and cables before any digging proceeds.

Senior Construction Risk Engineer for XL Catlin Fred LeSage urges vacuum excavation in conjunction with any digging around tolerance zones, which most state laws define as being 18" to 24" on either side of a located utility. He states that the "major reason why clearly marked lines are hit by excavation equipment is that someone digs within the safety buffer." It's gotten so bad that municipalities have started hiring their own vacuum excavator teams to locate pipes at construction sites, because they are worried about potential damages to their water mains.

The video also stresses the dangers of pre-scooping a dig site in order to make hand-digging easier for workers. As the narrator states: "There is no standard depth for burying cable or pipes." Another danger that excavators face is running across abandoned utility lines. It is far too common to see the markings on the ground and incorrectly expose the dead pipe, only to move over and hit the active one.

But are there better solutions on the horizon? Dennis Jarnecke, Research and Development Manager for the Gas Technology Institute (GTI) seems to think so: "Vacuum excavating has come a long way over the last decade. It was a challenge to find a vacuum excavator out on a utility excavation site, where today I would venture to say probably half of those sites have the presence of a vacuum excavator."

Buffered by classic clips from the *Digging Dangers* video archives, this latest chapter is sure to open some eyes about the importance of vacuum excavating, and hopefully lead to an increase in safety and damage prevention in all areas of excavating.

Want your equipment or your crews in a customized *Digging Dangers: Exposed!*? www.diggingdangersvideos.com

PLANET UNDERGROUND.TV

Planet Underground TV's premier episode will feature an insurance company's perspective of vacuum excavation.

The Utility Utility Man: Coming Full Circle with Kemp Garcia

As the old saying goes: "Jack of all trades, master of none." Kemp Garcia is certainly someone who proves this adage wrong. With over two decades of experience in the locating and damage prevention industry, Garcia wears a number of different hats and wears them well: locator, excavator, project manager, teacher, ambassador, designer and advisor. Whether slinging mud in a vacuum excavation truck, or mud-slinging in a political quagmire, Kemp sees his role as all-inclusive in the damage prevention industry. He was gracious enough to take time out of his busy schedule to talk to *The American Locator* about everything from GPR locating to changing dig laws to the future of utility mapping.

Beginnings, Bravo and Bellevue

"I started working in the locating world in 1992 for a family owned business out of Phoenix, and then moved to Seattle in 2000 to ultimately run that business, which I did for a handful of years. I then went over to Bravo Environmental in 2012. Bravo has been in business since 1997, they started out as a vacuum excavation company, and then also got into CCTV inspections of sewer and storm lines. I had worked with Bravo a number of times previously for my other job, and when I decided to leave, Bravo said to come work for us."

Working for Bravo allowed Kemp to begin to expand his resume beyond that of a simple locator. "They sold me on a couple of different things, but wanted me as a project manager in their locating division, to deal with all matters related to locating, as well as all SUE design work. I also manage potholing of utilities and major construction projects where we have vac trucks performing safe excavations."

Bravo's location in the Northwest US has also allowed Kemp to get involved with a number of large construction projects going on there. "We also work on leak detection. We have a large tunnel project that's been going on since 2012 here in the Northwest, as well as a number of construction sites that are all now required to have leak monitoring systems. We are installing data loggers on water valves throughout Seattle and now the city of Bellevue to monitor underground water leaks. As a manager, I'll provide the estimates and then oversee any project as it's ongoing through its completion."

Learning Curves, Glacial Till and GPR

While some locators might sneer at ground penetrating radar, because of its cost or supposedly steep learning curve, Garcia sees GPR as just one more tool in his arsenal to do a thorough locating job. "GPR has been very helpful to us out in the field. I started using GPR back in the early days, when it first came out, trying to interpret data and using the software was a much slower process."

Despite its slow beginnings, GPR has drastically improved over the years, and now seems even forward looking by embracing new technologies. "Whereas today, you're out in the field and you can pin anomalies off the screen in real time and know exactly where you are at. It seems like every system that has come out over the years has drastically reduced the learning curve needed to operate these radar units."

Geography and different soil types play a major role in the effectiveness of GPR, and the Seattle area certainly poses its own set of problems in this regard. "GPR does have its limitations, for instance if you have saturated soil, or if you have glacial till, which is a big problem in our area, it may not be the perfect tool. We were doing a job recently trying to find asbestos clay water mains, and we would find it in one location with a really good reading, through rocky hard dry soil. We then drove up the hill and ran the radar across another area and had trouble finding it. So we brought up the vac trucks to pothole down along the line and found that we were missing the mark, because it was very dense, saturated clay soil there. It's different everywhere across the nation of course, but here in Seattle your soils can change in literally a 15 foot area."

Intelligent Design

Aside from locating, Kemp is a firm believer and proponent of subsurface utility engineering, or SUE. He sees smart utility design as an integral part of damage prevention, leading to safer work sites and more cost-effective projects for contractors. "I've seen time and time again, and I try to promote and explain this in the dig safe classes I teach, that SUE is going to save cities and project owners tenfold on the construction side of the project. It's been proven that the more effort they put towards the design of a project, they save that much more money on the back end. That's how I like to look at it, because there's so many unknowns under the ground, be it lines that were in the ground that weren't located properly, or lines that were located but you don't know the depths of them. If you're putting a new sewer line in, you don't have much room for failure to move it up or down, because that existing line in the ground may all of sudden be at the elevation that you need the sewer to go through."

While mainly used for city projects, Kemp and his crew will occasionally do design work for other companies as well. "We as a company do this for private businesses. We recently did some work at a hospital and at a Boeing facility, but the majority of SUE work comes from municipalities. Most of the time we're doing this type of work for the engineering firms that are hired by the city."

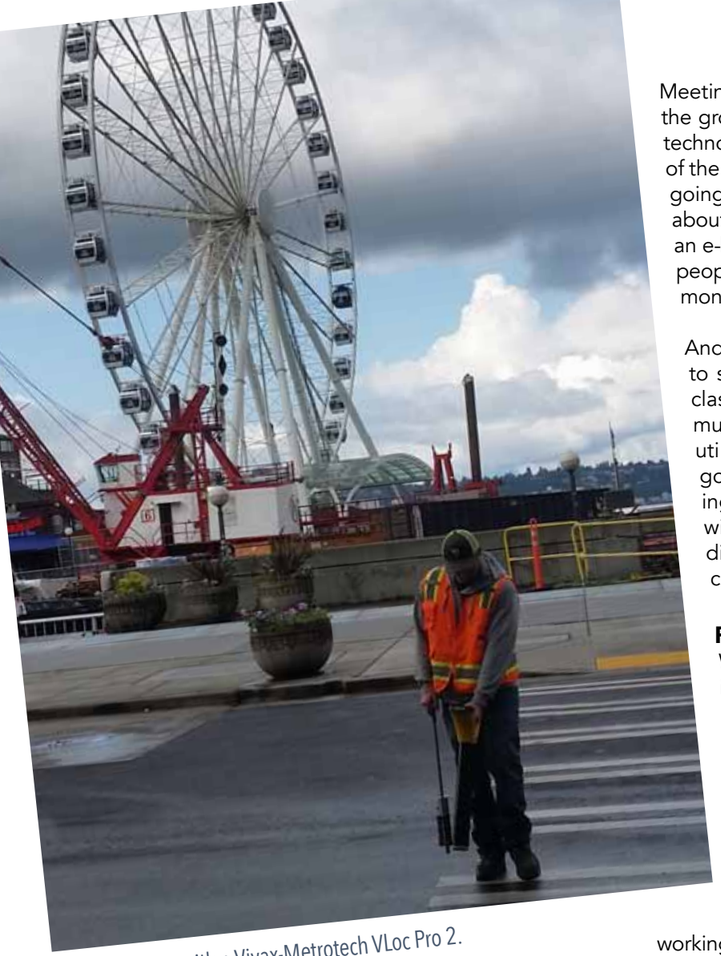
SUE seems like a sort of insurance policy against having to do future work in case a utility line needs to be moved or changed, and Kemp agrees. "We just recently got a job to do 25 different pothole locations, but they also wanted us to run radar across the alignment of this new sewer line and determine if there's any anomalies out there, which means that they would need to account for additional potholes. This increase in potholing work isn't necessarily good for the client, but it's definitely not a bad thing to have this information once a contractor starts to put this line in, just in case they run into something that they can't move and have to spend an extra $100,000 - $150,000 or whatever to have it moved. The owners hate to see change orders, they'd rather know the cost up front and budget for it accordingly."

Lawmaker, Promoter, Teacher

If decades of knowledge and experience in the locating and excavating world weren't enough to classify Kemp Garcia as a well-rounded expert in the damage prevention industry, then certainly his work in the 811 and one-call fields would seal the deal. Kemp was part of the Dig Law Safety Committee and also worked to revise the one-call law in Washington. I asked him about his 811 work, the politics of changing these laws, and how all of this impacted his role as a locator. "I worked with the Committee for two years, and it was an amazing process because you don't realize how political it all is. You think everyone is in there for the greater good of things, after all this is damage prevention and trying to save lives, but suddenly people think it's going to cost them more money on their end and then politics start to come into play. The complete project that we ended up coming out with was a better law I believe. Is it the perfect law? No, but it's better than what it was."

What are the best methods for getting the word out to the public about 811 and call before you dig programs? "All ways seem to work, I represent 811 at local baseball games, at flower and garden shows, everywhere. I have friends that have nothing to do with the industry, and

Two Bravo employees man the vacuum excavator on a busy street.



Street locating with a Vivax-Metrotech VLoc Pro 2.

they'll tell me they see this stuff." All of these promotions have seemed to show results and have had a direct impact in the locating world. "The ticket load has increased every year, because there's a ton of marketing out there now on buses and radio and TV that people can see on a regular basis. Our area is more of a suburban area, and you see more and more people calling in because they're planting a tree or something, which is great. Five years ago, you wouldn't have seen that."

While billboards and radio spots can help spread the message of damage prevention, Kemp sees teaching in face-to-face classes as perhaps the most effective way to learn these lessons. "So basically across the state of Washington, when the law was revised I thought there was a good avenue to start teaching this dig safe class. We did a handful of them at first and slowly we've been increasing the number. In 2016 so far there's been about 300-400 people we've taught. We don't just read the law as is it, we highlight important aspects of the law and basically discuss best practices on how to call in a locate and how to respond to a locate. It's first and foremost about digging safely, but also making sure that people get the correct information."

Meeting the people in person, and putting the boots on the ground seems to be an important part of this, though technology could be paving the way to expand the scope of the classes. "We go out to the actual sites to do this, I'm going out today to Spokane to teach two classes totaling about 70 people, though we would eventually like to get an e-learning course set up so we could reach even more people. We'd like to reach something like 1000 people a month, rather than a 1000 people every year."

And once someone takes the class, Kemp would like to see it taken even further: "For those who take the class, we do give them a certification card. No city or municipality requires that anybody digging on their utilities be dig safe certified. That's what one of our goals is, and we're hoping that if we get this e-learning class going and certify enough people that they will see this and say yes, we'd like to see that anyone digging on our projects, that they become dig safe certified."

Problems, Opinions and Solutions

When asked about the recent increases of activity in the construction and telecommunications market and how that impacts his business, Kemp has definitely seen a change on his side of things. "I think in our region, there is so much work going on that it's hard for locators to keep up. This is from a contract locator standpoint all the way to an in-house locator for a city." He also seemed concerned about the staffing and personnel issues involved. "Around here, there's so many construction projects going on, that trying to get enough people interested in working in this industry and getting locators compensated for their services seems to be the main problem. I also feel that sometimes people take this job as just a job, and not as a damage prevention professional."

Mapping utilities and keeping permanent maps of these lines and facilities always seems to be a turbulent topic for those in the industry, but Kemp Garcia was able take a broader look at the subject. "I think in the grand scheme of things that having maps available is a very positive thing. Going back to what we talked about with SUE, I think it's a great thing to have and utilize for a project, because then you don't have to go and chase down six different people to get the right information for that quadrant that they might be working on. That being said, I also see the concern from utilities over protecting themselves so they don't get damaged, so I can see both sides of it."

Kemp also has to deal with systemic problems in the locating world, like going out to re-verify previously made locates. "Many times we get out to sites, where contractors have paid us to go out and verify if the locates have been made correctly. This happens on a fairly regular basis, and most of the time the locates are relatively close, but there usually tends to be one of them out there that's floating and needs to be tweaked a little bit. On a project that we

just completed, we verified the location of the public water main prior to performing work. If we had relied on the one-call marks from the water department, we would have missed the line 90% of the time. Seeing as the work was at a fixed price, we would have lost money if we had to chase the line. But because we verified using a pipe and cable locator and GPR, we were right the first time at all locations."

Why does it seem to happen so often that a contractor needs to hire a professional locating service to double-check these locates? "I've heard all kinds of things, just a month ago we had someone tell us that, oh, we're too busy and didn't have time to go out there and locate it, and this was like three weeks later. Is it because they just don't put the effort towards it, or is it because they don't want to pay the locators? Yeah, it could possibly be all of the above. Overall, there should be more regular education and training for locating personnel. Events like an internal locate rodeo to keep skills sharp and determine if a locator requires additional training."

Kemp operating an IDS Opera Duo GPR locator with integrated GPS.

Kemp sees more hands-on experience, and a fuller understanding of the excavating process as a solution. "Honestly, I've been a locator my whole life, and a lot of times, I never saw what was dug up. I'm in a situation now, where we locate and we dig it up exactly where we located it, so I see the full circle of everything. Most locators never see that, so they just locate, and they may be locating what they think is right on a regular basis, and will get called out to that same area 10-12 times a year to redo it. They've just never seen it dug up, and I think that actually getting that visual is a positive thing."

Does he have any preferred equipment when locating? "When it comes to utility locating, I've always been partial to the Vivax-Metrotech equipment, and for sonde locating I've been working closely and beta-testing with Prototek devices."

How about a GPR preference? "We recently bought a ground penetrating radar unit to enhance our subsurface utility engineering, an IDS Opera Duo. The reason why I chose this over some of the competitors is the integration with GPS and Google Earth maps. It also utilizes two antennas and two different frequencies to be able to penetrate different levels through the soil, which really helps in our region."

Visions for the Future

And finally, what about the future of the damage prevention industry? Kemp wants to stay positive that things will improve, but isn't ready to rest on his accomplishments yet. "I'd like to be optimistic and see everything continue to grow. For instance I'd like to see NULCA's, accreditation program be implemented nationwide and required in most cases for locators to have."

Kemp's years of experience and all the different roles he plays in the damage prevention industry have left him with a unique viewpoint in the locating world, an all-encompassing vision that doesn't end at the work site. "The way I look at it is, when I put paint on the ground, I'm always aware of my responsibility to that mark, and I think that this overall awareness of the potential damages that may occur is important to keep in mind. I'd like to see locators in general realize that their job affects lives. That just because they put paint on the ground and then leave the site, doesn't mean that they shouldn't continue to worry about what they did, that they are part of that shared responsibility of damage prevention."

The Pros and Cons of Potholing: Examining Safer Methods of Excavating

By Justin Maloney,
President, Patriot Pipeline Safety Corp.

Vacuum excavation has grown in popularity over the last decade and many excavators, contractors and utility owners now require it when working around their utilities or facilities. Vacuum excavation can be done by air pressure or water pressure, creating a jet of force to penetrate the ground without puncturing the utility when contacted. While this form of excavation is by far one of the safest methods used in the industry today, there are pros and cons to its use that need to be considered.

Identifying facilities without exposing

Yesterday's accepted form of identifying a utility was probing, and there are a variety of probes made for different soil conditions. Some will have pointed tips while other are rounded; some have just a T-bar handle, while others come with hammers. Hammers are great in frozen or dense soils, however they deliver more of an impact on the utility when it is contacted. A couple of concerns have risen over the years regarding probing. First, it takes a skilled hand and experience to know when you have contacted a utility with a probe. Even then it may take a few attempts in order to verify you have contacted the utility, and not a series of cobble rocks that usually frequent pre-disturbed soil. The effects of probing should be taken into account, especially for metallic utilities, as should the age of the utility to be located, since backfilling requirements are not the same 40 years ago as they are today. Today we have such equipment as Ozzie padders, Outlaw, and ALLU grinder and shaker buckets. These buckets provide a very nice backfill and supporting underbelly for the utility itself in order to help with sagging after the trench has settled and cycled through a few periods of freeze and thaw.

An ALLU bucket in action.

The second main concern is that probing has been linked to coating damage, which over time leads to holidays and pitting. The pointed tips on probe rods help drive through hard soil, compacted sand, and clay but can damage utilities that have older types of coating such as coal tar. Coal tar was used as a rock shield and often flakes off when exposed if it has undergone exposure to moisture over time. That is why the guessing game of what a contractor, third party, or utility representative may or may not find is eliminated when using vacuum excavation, as it gives you an opening in the ground to see your utility with minimum potential for damage.

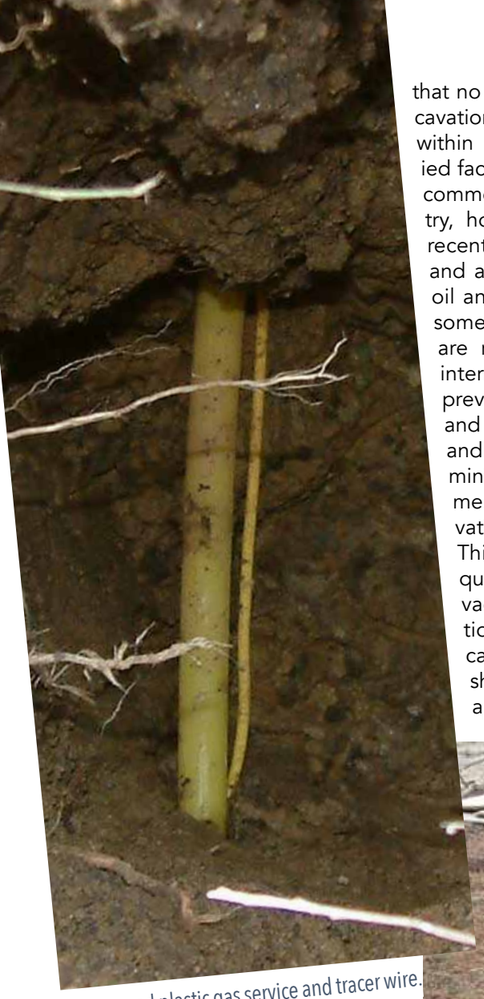
Minimizing damage with vacuum excavation

Vacuum excavation is done with either a large truck that comes with onboard water heaters, compressors, and generators or mobile tow units. Vac trucks may be able to carry more excavated material, however they are sometimes cumbersome and bulky. Vac trucks are favored on solid ground where there is ample room to maneuver and work. Transporting the excavated material may take considerable turnaround time and cause delays without the availability of an onsite or nearby dumping area. Also, environmental permits may need to be applied for depending on the location and material of the area to be excavated.

Mobile units are designed to be more portable and used in congested or difficult-to-access areas, which means that oftentimes contractors may purchase a tow-behind unit as they are more user friendly and applicable to a larger variety of working environments. If vacuum excavation is regularly required in a contractor's scope of work, they may purchase tow-behind units for efficiency, independence, and long-term cost effectiveness.

In most cases, vacuum excavating a utility provides a pothole simply to identify where a utility is, not so much to fully expose it. A pothole is most commonly a circular hole in the ground leading to the suspected area where the utility may be. How the pothole will be made depends on what the contractor needs to know. If a utility just needs located, then the pothole will be made just to the top of the utility so the owner or contractor can verify that it is indeed there. This measure is often required as assurance and verification within company's safe work policies and procedures.

If the exact size and location is needed then the pothole will identify both the top and sides of the utility with the sides fully exposed until the downturn is verified. This allows contractors to identify the common 2' rule, which means



An exposed plastic gas service and tracer wire.

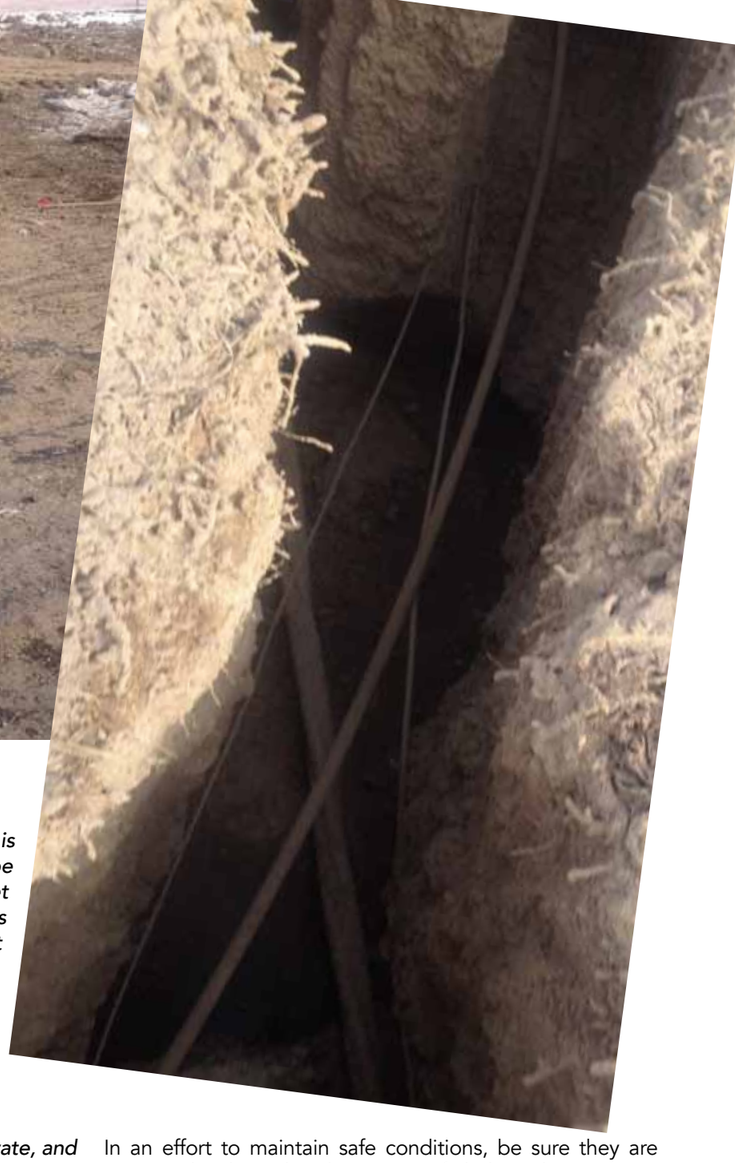
that no mechanical excavation should occur within 2' of any buried facility. This rule is common in the industry, however due to recent line contacts and accidents in the oil and gas industry, some companies are reviewing their internal damage prevention policies and procedures, and increasing the minimum footage mechanical excavation is allowed. This raises the question that if vacuum excavation is mechanical excavation, should the rule apply?

The answer is that vacuum excavation is a form of mechanical excavation, however it is not deemed to be a form of excavation that the rule is intended for, such as those made by a trackhoe, backhoe, or tiling machine. If a bore is to take place near or under a utility then the entire utility must be found, and definitely should include the top, sides, and bottom of the utility. This determines location, size, and surrounding environment of the utility as some utilities share a trench with others. This information should be gathered and openly communicated in a drill profile before any type of bore is made which crossed or parallels any utility, including all conventional bores, horizontal directional drills, track bores, cradle bores (suspended bores), and hammer bores (thumpers). It is recommended that a coating representative or corrosion technician who has hands-on coating application experience, knowledge with multiple coating brands and application methods, and who is NACE (National Association of Corrosion Engineers) certified, should accompany any pothole excavations to verify the coating condition during and following vacuum excavation. This information is vital for possible repairs needed on the coating and the overall condition of the coating on any utility in that vicinity.

Potholes made on utilities crossing right-of-ways that will undergo construction should be done a minimum of three times per utility. More than three potholes may be required when the direction of a utility changes and 100% verification of location is needed on the right-of-way area to be constructed on. This helps identify the points of intersection, and is a recommended practice for verifying direction, depth, and shared trench lines. This step is crucial for the safety of any crews that might follow with excavation activities, as the more exact the data provided, the safer the crews will be in the future.

Three pot holes have been made along the path of this buried utility, meaning it could be intersecting another line somewhere down the path.

Exposing entire spans of buried cables in a right-of-way.



Pros and cons of vacuum excavation

Pros: Potholing a utility by vacuum excavation is the safest form of excavation today. It should be practiced following submission of a one-call ticket for the area to be excavated. Potholing provides a form of positive identification required in most damage prevention programs today and can eliminate any guesswork relative to size, depth, and location of a utility in question. Excavating with a tow-behind unit can also mitigate environmental damage to sensitive wetlands or areas affected by rain or runoff.

Cons: Truck units gain weight the more they excavate, and this weight can make them heavy and difficult to access wet or congested areas or right-of-ways. Approved dumping may be an issue due to lack of space or environmental regulations. Getting water for the hydro-vac units may also cause additional turnaround time. These variables should be considered when determining the type of vacuum excavation service you may pursue, or if it may be worthwhile to purchase your own small unit. And of course, both tow-behind units and trucks are mechanical and anything mechanical can break, causing downtime at the dig site.

Whichever way you decide to implement this good practice, be sure to remember your men and women operating these units. They will be exposed to all kinds of weather, and vacuum excavating can be a dirty and exhausting job. In an effort to maintain safe conditions, be sure they are equipped with insulated water proof clothing, hearing protection, hand protection, and comfortable safety glasses. Also be sure that whatever type of vacuum excavation rig is used for potholing, that there is an equipment safety checklist completed daily on the unit, and that at minimum it has a first-aid kit, approved fire extinguisher, and a spill kit.

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Director Profiles

An Interview With Sam Johnson

Recently, President Executive Director of Mississippi 811, Sam Johnson took time out his busy schedule to talk with The American Locator. *As befitting a man who has spent over thirty years in this industry, Sam was very forthcoming and knowledgeable as he chatted about everything from recent changes in state legislation, mapping with aerial drones, and the future of one-call centers. Here in his own words is a conversation we had with Sam:*

Could you tell us a little about your background, how you got into the one-call industry and how long you've been the Executive Director at Mississippi 811?

Well, I graduated from Mississippi State University in 1971, and I had played football there, so I had to cram that four years into five before I could actually leave. In 1972, the pipeline safety divisions all across the United States were getting started, so I was hired by the division here in Mississippi, where I stayed for about 13 years. Then during the early 1980s, a rule was handed down from the Office of Pipeline Safety out of Washington that stated that the pipeline companies had to have a better way for the excavators to get in touch with them. And so in my opinion, that was the driving force across the nation to really get one-call centers going. There were some already in existence of course, and we were able to use those to help model our own system. I had sent a letter out to about 200 total utilities and operators, and we had over 100 of them show up to a meeting at the Mississippi Valley Gas Company, as it was known at that time. A committee of eight members was formed, and I was asked if I would chair it. So in 1982, we starting working and visited a few one-call centers that were already in existence, and then put our bylaws and operating procedures together. Then towards the end of 1983 when we had all this accomplished, I went to a board meeting and said I had finished my job here and was headed back full-time to the Public Service Commission. And they responded: before you go, we want to ask you about something, and that something was heading up the one-call program. I was very interested in this whole process, and so I went to work in February of 1984, which as of a few months ago, has been 32 years total now that I've been President Executive Director. We've moved offices a few times, but have stayed here in Jackson, Mississippi for that entire time.

How many calls do you process on a daily basis at your facility? How many per year?

We are right now processing about 1250 or so calls a day, while in 2015, we took a little over 300,000 calls total. And we look to be surpassing those numbers in 2016, as we're already up over 20% from this same time last year.

Could you tell a little bit about the web-based services your facility offers? Do you feel that these online features help improve the quality of service from your one-call center?

Absolutely, technology is just where we are today, and being able to utilize technology is fantastic. These web portals that we have on our website will allow an excavator to go in and do research on their tickets, and have that information in front of them. For the advanced users, those that have had a little bit of training on how to use our portals, you can enter your ticket information through here and there's just a tremendous amount of data that's available for them. And also the apps that we have for phones, both the Android and the iPhone, act as an extension of these portals.

I saw that on July 1st, 2015, changes were made to the Mississippi dig law regarding the life of a locate request, could you tell us about this new legislation?

Yes, that was a change that was made in the last legislative session. Our dig law had always stated that a ticket was good for 10 working days, so in order to make that timeframe more compatible with our software and the notifications that need to go with that ticket, it made it more user friendly to change that time to 14 calendar days. It was just a change to help with our system and negotiating the times that the law allowed for the life of a ticket.

Mississippi 811 Damage Prevention Coordinators, from left to right, George Lewis, Charles Stallings, Jerry Kennemur, Henry Greer, Bill Rutledge.

With the growing nature of the housing market and the exploding telecommunications industry, have you seen an increase the number of tickets coming into your facility? If so, how do you plan for these record breaking numbers of locates?

We have seen this, we've been seeing it for about a year-and-a-half now, when some of these major companies decide to enter into big projects. Moving forward, it means a whole lot more planning out there that's going to need to be covered by us. Is it ever going to slow down? I'm not sure, but there's an awful lot of work going on out there. The process they're using with these boring rigs… there have been some damages that occurred, and in general it's been quite an experience for this expansion that's been taking place. There's no doubt that this has caused a tremendous increase in call volume, but to their defense, most of these companies came to us initially and let us know their plans, like what their start days were and so on. The fact is though, that not all of the utility owners in the area where these expansions were taking place were able to muster up enough manpower to keep up with the locate requests that were being asked of them. That's been quite a challenge for them, but hopefully they'll be able to get staffed up to handle these volumes. For us, since the first of the year, we've been hiring and training people to handle the increased call volume, but have also partnered with other states like Texas to help us get through a tough spot if we have a quick expansion of calls.

As you know April is National Safe Digging Month, so what do you feel is the most effective way of raising awareness of 811 and the one-call system? Do you find that there's one method that works better for you than another?

Thankfully, we're able to utilize a wide range of tools to get our message out there. I'm not sure I could pinpoint which way is better, they've all been effective to a certain degree. We have a statewide radio program that runs twelve months out of the year, as well as a television program that runs all year. We also have a tremendous billboard campaign, covering all the major highways, and many of the secondary areas as well.

It all seems to be working, the awareness level when we go out and do safety meetings is very high, more and more people are showing that they know about Call Before You Dig. We have 42 local damage prevention councils throughout the state of Mississippi, and our coordinators are out there working with the utility operators and professional excavators. They'll come to our meetings a few times a year, and we can draw 100 or more people sometimes to these meetings. We had 261 such meetings in 2015, and were able to meet face-to-face with almost 30,000 people. We also go out to 30-40 events and trade shows a year, anything to do with the excavating community.

Is there anything unique about the state of Mississippi that sets it apart from one-call centers in other states?

I think for us it would be this mapping system that we use. There aren't very many people that have been able to do this. We have entered into a project about twelve years ago where we remapped the state of Mississippi. Our maps that we had access to were so bad that a GPS point put onto an existing map when tied into real-time coordinates could have been 2000 feet or more off from where a street or highway was actually shown. So if we wanted to be able to take tickets from callers who gave us GPS coordinates, then we knew we had to have some accurate data. So in the early 2000s, through a grant from the Office of Pipeline Safety, we were able to establish a GIS department. We

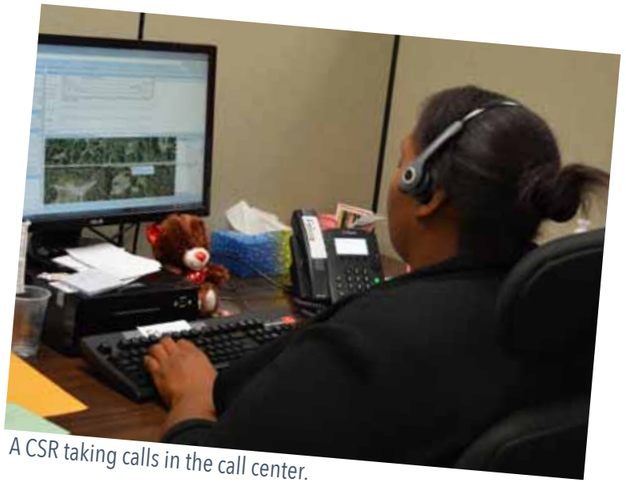
Mississippi 811
protecting Mississippi's vital flow...one call at a time

started with a basic overlay that had been digitized to real-time coordinates, and then took orthoquads (aerial drones) to do a fly-over of our state that was drawn to scale. We were then able to access that information, and began putting in streets and highways and buildings in these towns and communities that weren't previously on there. We have five damage prevention coordinators, and three of those guys are set up with GPS units and mapping software.

Our customer service representatives are the first ones to know about a new street or subdivision, and when they hear about a new one, they will notify our GIS department who then alerts the particular coordinator that works in that area. He can then go and map the new place, and basically overnight we can have any new area mapped and sent back to the mapping system at the call center for immediate use. We share these maps with any of our members and also government entities, like the emergency management department of Mississippi and the Highway Patrol. Another positive thing that this mapping project does, is it allows us to have a very narrow corridor or spatial database around our member's facilities. They can go into the database and build a map outlining their notification area, and it basically allows a screening mechanism of tickets, meaning that if somebody isn't digging in their area, they're not going to get a locate notice. That's a tremendous benefit for them, and leads to lowering our ratio of outbound to incoming tickets to something like 4.5 to 1. The cost involving and regarding one-call is not necessarily what a member pays for a ticket, it's what it costs them to go out and investigate whether or not they need to go out and locate. We feel that our mapping program has allowed our members to have their own unique notification area, which has decreased the number of unnecessary locates for them.

What role, if any, do you think one-call centers play on the enforcement side of things, when it comes to excavator violations and maintaining safe work areas?

I may actually be getting a phone call during this interview that tells me some very encompassing, effective enforcement legislation has passed, as today is the day they're voting on that. We're talking about Mississippi's damage law {Regulation of Excavations Near Underground Utility Facilities}. If you've kept up with the PHMSA efforts and the rule that was passed and became effective January 1st, it is requiring that there's going to be enforcement on violations of the excavation process. And if the states enact their own effective enforcement programs, then PHMSA will not come in to override that state program. So that's what we've been working towards, and it's looking really good that we're going to have this bill passed. What role we have had is to be involved in the legislation for the purpose of helping keep



A CSR taking calls in the call center.

the federal government out of our business. And that's not to say anything derogatory towards PHMSA, those people have been super to work with, but they don't want to be involved in this enforcement mechanism.

So because of the massive numbers of members that we have, which is basically all of the utility operators in the state of Mississippi, it's in their best interest that the federal government not have an enforcement arm here. That's been one of the main driving forces behind us being involved. The fines and penalties that the Feds can bring with them are tremendous, we're talking hundreds of thousands of dollars a day per incident. So Mississippi's law is going to have maybe a $500 fine to start off, and if you're going to keep violating and not change your habits, you could be fined up to $2500. It's going to help keep excavating in this state safer, that's what this is all about. Right now, this is just proposed, but we think it is going to come to pass.

(Editor's note: Senate Bill 2755 was indeed passed on 4/19/16, as an amendment to the Mississippi Regulation of Excavations)

What are some of the new and exciting trends or technologies that you're seeing in the industry? Is there anything you'd like to see in the future for one-call centers?

I think continuing to develop the electronic notification type of technology is going to be a real big move for the future. More and more people, with the way the systems are designed and built now, can access us online or through their apps, and can turn in their tickets much more easily. I just think we're going to see more of this type of technology trending towards helping to make the information more clear, to know exactly where that excavation site is for example, and that in the end is a tremendous accomplishment for everyone.

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MARYVILLE, IL—4/6/16

At 1:45 p.m., a construction crew working alongside Route 162 in Maryville, IL struck a high-pressure 10-inch steel gas line, causing a gigantic explosion and fire. An injured construction worker was pulled to safety by a Maryville police officer. The explosion left the worker in critical condition with third degree burns to over 70% of his body. He was initially taken to Anderson Hospital, then flown to Mercy Hospital in St. Louis.

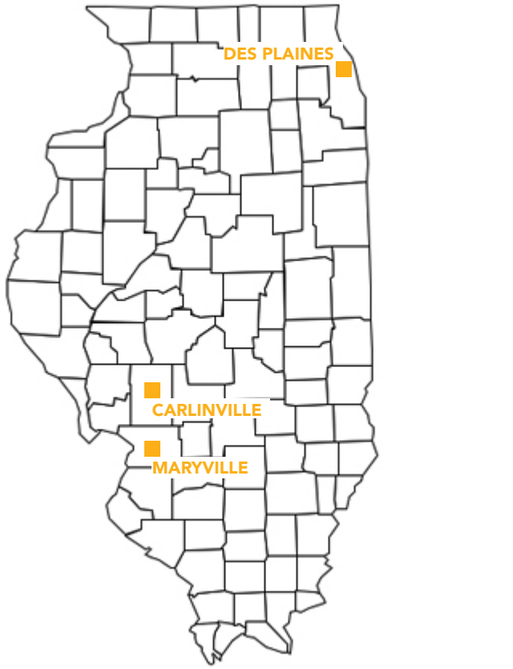
Despite the serious injuries, the worker was originally considered to be on the path to recovery, as early reports indicated his lungs were not damaged. However, after a surgery and attempted recovery, the worker passed away over three weeks later on the morning of April 29th.

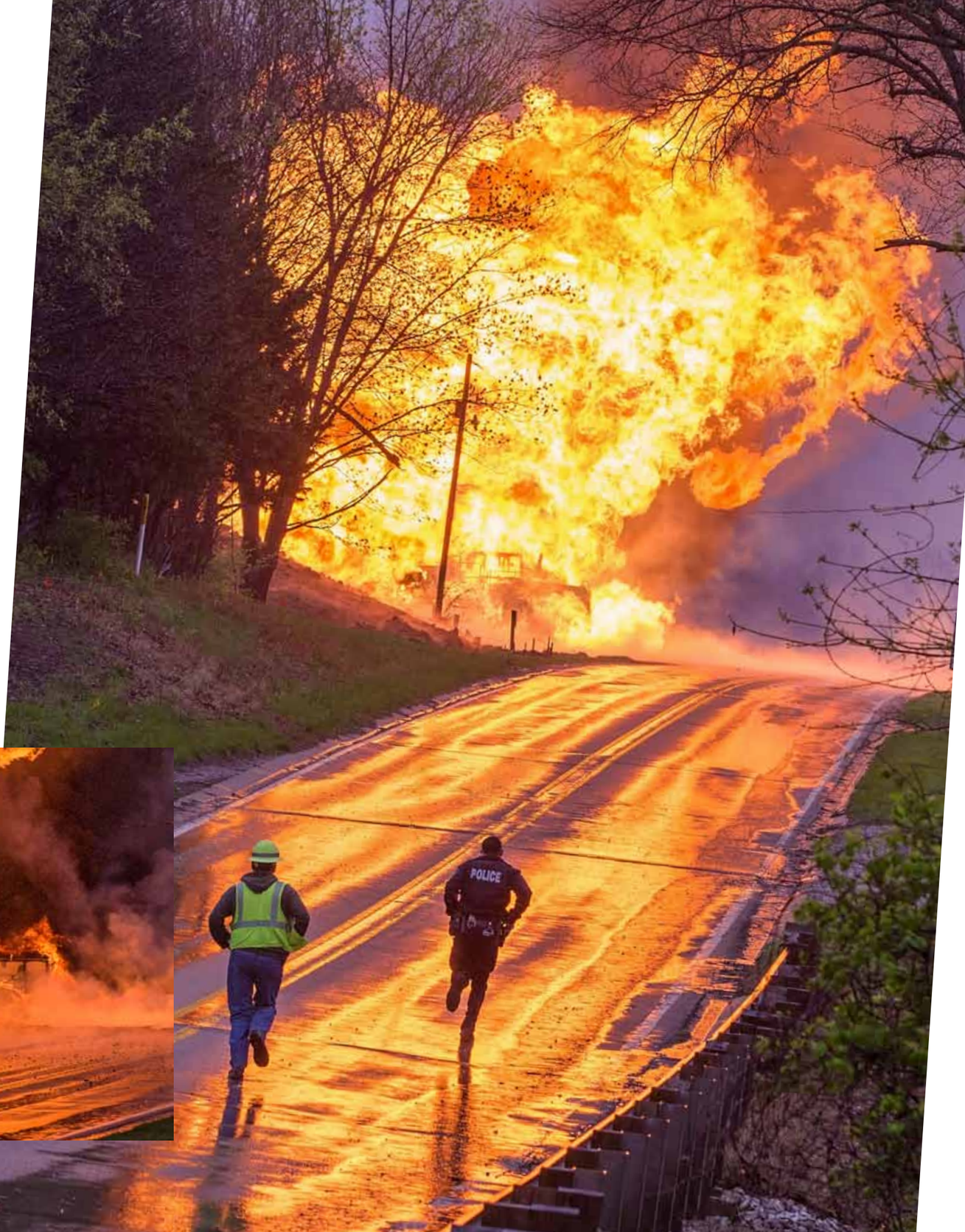
Excavators on the scene were operating with a valid ticket for a project locate, and there were marks on the ground. The workers were using a grader-scarifier for tilling lime into the soil to dry it out, a process known as lime stabilization. The grader was digging at a depth of 15”-18” when it hit the gas line, which was buried only 10” under the surface.

The flames set a nearby utility pole on fire, and also burned several parked cars that eventually exploded. The gas company arrived to quickly identify the damaged line and shut off the gas.

A gas company representative reported that the breach in the gas main was large enough that the change in pressure was recorded over 110 miles to the north at a monitoring station in Decatur, IL. He said two shutoff valves were turned off by workers at locations on or near the highway.

Several nearby homes were evacuated for most of the day, and Route 162 was shut down to all traffic while fire crews and struggled to contain the blaze.





Photos by Jim Simmons, JJS Photography

CARLINVILLE, IL—5/11/16

Utility workers installing a new water main at 430 N. West St. struck a natural gas line, causing an explosion which levelled a single-family home in Carlinville, IL. Apparently the gas line was located incorrectly by the contract locating company. The gas company which provides service for the area was called to the scene, but before a crew could shut off the gas, the house blew up.

Two inhabitants, a mother and her 20-year-old son, were inside the home when the explosion occurred, which according to the Illinois State Police happened at 10:42 a.m. Both were taken to a local hospital, but suffered non-life threatening injuries.

The explosion, which happened just a block south of the Carlinville City Hall, caused at least 14 homes to be evacuated around the area. Flames from the burning house melted sections of siding on a neighboring home, but firefighters on the scene were able to save the residence.

By 7:00 p.m. on the day of the incident, the State Fire Marshal still had not authorized residents to return to the evacuated area, and some people were preparing to be out of their homes for the night.

Photos courtesy of Eric Becker, Macoupin County Enquirer Democrat

Photo courtesy of Richard Mayer, Journal Newpaper

DES PLAINES, IL—5/19/16

A worker from a contract locating company struck a plastic gas line with a grounding rod, causing a major gas explosion at a three-story townhouse building in unincorporated Des Plaines, IL.

Fire officials reported that only two people were in the six-unit building at the time, but both managed to escape with minor injuries.

The explosion, which happened in the basement of the townhome, blew out several windows and partially collapsed one wall of the building. A nearby parked car was also damaged by the debris. According to the Cook County Sheriff's Office, the destroyed wall and subsequent structural damage left the building uninhabitable, resulting in approximately 30 people being indefinitely displaced from their homes.

A Journey Into the Subsurface:
Locating Amazing Things with Dennis Prezbindowski

Geologist, researcher, trainer, locator and GPR expert Dr. Dennis Prezbindowski has worked in the energy and damage prevention industries for over 35 years. He was kind enough to sit down with *The American Locator* and tell us his story of how he became involved in the industry, and why he is one of the leading authorities on ground penetrating radar.

Studying the earth and the multi-layered mysteries it contains was a passion for Prezbindowski from the start. "I wanted to be a geologist since I was about six years old, it was just what I wanted to do. So basically I had a real interest in the outdoors, and understanding the subsurface. I also had an inclination towards working with instruments, both laboratory and electronic types that allowed me to do non-invasive characterizations of the subsurface. I received my PhD in Geology in 1981 from The University of Texas at Austin, and subsequently worked in the energy and environmental industries conducting geological studies for approximately 30 years."

His first stop on this long geological journey was a job at Amoco. "After I received my PhD, I went to the Amoco Research Center in Tulsa, Oklahoma, where I was responsible for finding new technologies that would be of potential use to Amoco in their energy exploration and exploitation projects. I worked there for about 6-7 years and then I decided to spin off on my own and become a geological consultant."

This experience in the corporate energy world led to government and consulting jobs, all based around Prezbindowski's area of expertise: the subsurface. "In 1990, I sold my practice, came up to the Indianapolis area and started to become more involved with environmental geological consulting. I was predominantly working with the EPA at this time, being an expert witness and technical advisor for them on a part-time basis. I was also involved in other projects which provided geological models of the subsurface and near surface environments."

Throughout the 1990s, environmental awareness was spreading all over public opinion and within world governmental bodies, and his work with the EPA reflected these trends. "Some of the things I was involved with had to do with industrial waste disposal in very deep aquifers. At the time, a lot of these companies were using very simple geological models to predict where their waste material was going to go, and what they started discovering was that the movement of these industrial liquids were not following their projected models. So I became involved with the EPA and these other entities to consult them in terms of better characterizing the movement of this material through the subsurface. I helped them understand and remediate contaminations of the soil and groundwater systems, because in the 1990s, there was an increased interest in understanding what happens in the subsurface, both in shallow water and deep systems."

Whether working for the government or large corporations, the goal for Prezbindowski was ultimately the same, increasing our knowledge of the underground. "Also during this time, I was still doing detailed geological work for the energy industry, so I was wearing a number of different hats back then. In 1997 Texaco had wanted to hire me, so finally I did agree to work at their technology center in Houston as one of their Senior Research Geologists, where I did a lot of overseas work for them. But the unifying point of this thing was all revolved around trying to get a better understanding of the geology of these systems, to better predict where these fluids are moving, and to improve our comprehension of the subsurface."

But as the saying goes that necessity is the mother of invention, Prezbindowski realized that he needed to expand his knowledge base to fully understand and supplement his work on the subsurface. "When you get deeper and deeper in the subsurface, we know less and less about what's going on down there, because we have difficulty accessing those areas. And when you do reach them, perhaps by individual bore holes, the actual process of drilling the hole can disturb the system you're trying to measure. During this time, we were always interested in non-invasive characterizations of the subsurface, and there's the hook right there: finding non-destructive ways to see underground."

This started Dr. Prezbindowski down the second path of his career, a journey into the tricky and often misunderstood field of GPR locating. "These types of studies required an understanding and use of non-invasive methods for investigating the subsurface. I eventually moved back to Indiana where I decided to try and build a shallow geophysics and geological consulting practice, using magnetics, electromagnetics and ground penetrating radar to better characterize the subsurface. In the process of developing this skill base and building this practice, I realized that I didn't really understand utilities and utility locating."

It's never easy learning a new craft or skill, especially one as complicated as GPR locating, and he had to start at the beginning and train with the equipment just like anyone else. "During my first year of providing this type of service I realized that I needed to understand utility installation practices and be trained as a utility locator using EM technology in order to better characterize the subsurface at project sites. In recent years, I've provided suggestions regarding the use of GPR and other geophysical techniques that might be useful in locating utilities beyond standard EM locating."

Prezbindowski's extensive background in the geological and energy industries gives him a unique perspective on the locating world. "So I came at utility locating from a different angle than a lot of people, I came from a geological and geophysical point of view. From having worked the subsurface through a variety of different studies, I could say to people, I can characterize these dig sites. But most of these sites were environmental sites, or redevelopment sites, and there were a lot of utilities associated with them."

This viewpoint has also allowed him to become the perfect ambassador for understanding GPR. "So that's when I looked around and immediately said to myself, I have to understand utility locating. As I was completing my training however, my perspective was why aren't we using these other techniques to better image these sites and locate these utilities? One of the methods of course was ground penetrating radar, because there's some utilities you simply can't find with EM."

As he learned however, grasping the intricacies of GPR can be a tricky process. "GPR seems outwardly simple, but in reality it is very complex. One of the most difficult things for people to realize is that the image you see on the screen represents electromagnetic contrast surfaces, and NOT surfaces as you would see with your eye. Now, you don't need to know all that complexity to become a good imager. But in order to really sharpen your skill base and develop into an advanced GPR operator, you have to know how the instrument works and what exactly it is measuring, and ultimately how that impacts your interpretation of what you see on the screen."

Through his wide range of education, experience and expertise with the subsurface, Prezbindowski has been able to parlay this knowledge into a comprehensive overview of all matters related to locating, and GPR in particular.

We are excited to bring his opinions and insights to you, and hope that this will deliver a wider appreciation of GPR locating to our readers. "There's a lot of information you can get with GPR that you can't get with EM. For example, GPR can tell you what's in your trench, if there's dead utilities in it, or even if there's multiple utilities in it, which EM cannot necessarily do. So there's some really amazing things you can do with radar that compliment other kinds of locating."

When Engineers Become Locators

HBK Engineering was founded in 1998 and is headquartered in downtown Chicago, with five total offices across the Midwest and East Coast. This large firm specializes in utility design and everything that entails, from grid construction, permitting, and tunnel design, to subsurface utility engineering, telecommunications design, and mapping and database management. They also perform another service to fully complement their utility work: locating. Ron Kaminski, CEO and founder of HBK, says, "If you think back to why we went into locating as an organization, we felt that it provided the full circle of what a utility engineering company can provide."

The Path to Locating

Subsurface utility projects in a large, aging metropolis like Chicago is a complex business to be sure. Everything from crumbling infrastructures, to lost or non-existent utility maps to congested, overcrowded easements can lead to major headaches for project managers. Kaminski says, "By closing this circle and bringing locating in, we learned that while we had always respected the locating field, we were initially overwhelmed by the difficulty of a straight business model of running this initiative." When HBK decided to add utility locating to their wide array of services, it was to complement and enhance their already existing engineering and design work.

HBK's approach to utility locating is slightly different than your standard contract locating service. For one, they are recording and keeping all data recovered in the field in a permanent database. This infrastructure mapping that they've created is crucial in an urban environment, and helps immensely when projects cover areas that have been previously located or excavated before.

HBK uses top of the line and cutting edge technology to create these maps, including the latest Geographical Information Systems Software (GIS), survey-grade Global Positioning Systems (GPS) technology and Three Dimensional Point Scanners, and expects that one day their locators will be able to wield these tools as part of their everyday equipment. Kaminski says, "What we're defining is what will be today's locators and what will be the locator of the future. I foresee locators that have expertise in not only the job they have today, but also the ability to understand and work with CAD and GIS systems and database management."

An HBK locator works alongside Wacker Drive in downtown Chicago.

Planet Underground TV visits the HBK offices for a round table interview. From left to right: David Reyes, Ron Kaminski, and Eric Bergstrom.

HBK also deals with subsurface utility engineering, and their SUE work goes hand in hand with their utility locating, as ALL locating staff members are cross-trained in both topographic and GPS survey procedures. This leads to more efficiency and ultimately more cost-saving. Says Kaminski: "Because we've been able to bring our own locators in house, it has allowed us to put locating more into the design phase. If we can get our clients to understand that we're able to get more accurate information on the front end of the design and planning phase because of this, it will save them millions of dollars in construction and potential relocation costs."

Building a Better Locator

This also creates an ideology amongst their employees that underlines the connections between design and locating, between mapping, identifying and utility protection. Vice-President Eric Bergstrom adds, "Keeping our locators on a path of growth, they start to look at this job as a long term career progression. While we thought initially that we'd be teaching the locators about how utilities were designed and how they were built, our engineers and designers learned an equal amount back from them."

Keeping these employees on a solid career path also keeps all of that collected knowledge within the business, something Ron Kaminski sees as vital to the success to of his company. "If you lose a locator that goes on to another career, you lose so much inherent knowledge of the area in which they were hired to protect. So if we look at the very optimistic goals for the future of damage prevention and utility design, we're going to need locators that are vested into that career path."

HBK does this to give more of a career mindset to their utility locators, to show them the bigger picture of what they do, and they believe that this has led to the continuing success of their company. As Project Manager David Reyes notes, "Having the designs in house and making them available to the locators, helps us narrow down our focus to where the excavations are actually happening. These locators that we keep on can develop long term relationships with the excavators, and that level of communication between design and excavator and locator allows us to work more effectively and efficiently out in the field."

This has also led to a higher retention rate, in what is notoriously a high turnover industry. As Bergstrom says, "The importance of retention is really key in our model, and allowing the locators that growth and progression gets them interested in their jobs, which leads to a very high level of service and protection for our client's facilities." Reyes also notes that weather patterns in a city like Chicago can also play a role, which makes HBK's employment plan even more important: "That career path that you talk about is a wonderful example of what we can do in an industry with high turnover rate, where seasonal fluctuations cause people to fall out of locating and lose that depth of knowledge that they had for the infrastructure."

Employee retention is just the beginning for HBK though, as they also want to create a more multi-faceted locator, believing that a better understanding of the job at hand will lead to better employees. Bergstrom notes, "We're able to cross-train them in various disciplines that help them expand their experience and background. For instance, by taking them off of their locating assignments and intermingling them with our survey crews, this gives them a better understanding of the spatial relationships between elements out in the field. We'd like to take this back into the industry and say, we are building a different type of locator that's more equipped to deal with various types of situations."

"I think what we're seeing is that our locators understand the importance of what they do, not only in protecting the utility, but providing data back into our company that we can then use down the road."

What Makes a Good Locator?
So it's one thing to make sure your employees are aimed down a path to long-term employment with your company, but what makes utility locators operate efficiently and competently out in the field? Bergstrom seems to know the answer: "Good locators are going to be those who spend a lot of time looking at prints, and a lot of time operating their equipment out in the streets. But the very **BEST** locators would be that same person, who also drove a backhoe, or who also created utility designs, because then they would really understand the full scope of these projects." Elaborating on this, Eric adds, "We saw a lot of value in taking that on the street locating activity and combining it with in office engineering and atlas research, and bringing these two skill sets together. This creates a really powerful take on where these utilities are on the street."

Ron Kaminski adds, "I think what we're seeing is that our locators understand the importance of what they do, not only in protecting the utility, but providing data back into our company that we can then use down the road. Pushing the envelope of what we can do behind the scenes from a programming perspective is very important too, from moving locators from one location to the next, to how we process tickets in different regions and neighborhoods."

When all of these ideals are put together, it leads to a professional and respectable reputation in the damage prevention field, one which HBK is proud to live up to and maintain. Reyes says, "The relationship to the locator within the context of an engineering firm helps elevate the locator in the business and out in the field. They have all of the backing of our design staff, and with our team we're really trying to create a service driven atmosphere within our company, and give them the credibility in this industry that the excavators are searching for."

HBK locator Lilah Berrios.

HBK locator Erwin Hernandez.

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New Vermeer by McLaughlin Verifier™ G3 Brings Speed, Simplicity to Locating

Congested underground conditions, unmarked utilities and increasingly strict regulations. These are just a few of the challenges utility contractors face today. All the while, both deadlines and margins are getting tighter. Locators are under more pressure than ever to identify utility lines not only accurately, but quickly as well. With the launch of the new Vermeer by McLaughlin Verifier™ G3, McLaughlin is answering the demand for an electronic locator that combines trusted precision with a simple, user-friendly interface.

Users can expect the same core qualities that defined the Verifier product line including: a durable design with antennas mounted in rubber isolators for the toughest jobsite conditions; the exclusive McLaughlin three-year warranty and weather-proof guarantee. Additionally, the G3 offers a lineup of new features for quicker, more precise locating.

New features

Combination peak and null screen

In addition to the separate peak and null locating screens found on the previous Verifier models, the G3 features a new combination screen. This eliminates the need for users to toggle between two screens and enables them to capitalize on the benefits of both functions—the accuracy of peak mode and the user-friendly null mode.

Semiautomatic and manual gain adjustment

McLaughlin strives to provide the most accurate locating tools in the industry, which is why it maintained the semiautomatic gain adjustment feature. Gain adjustment refers to the receiver's sensitivity to the magnetic field emitted by a utility line.

"The benefit of the semiautomatic gain is that it's a very precise method of locating—especially in congested areas—and the technology is exclusive to McLaughlin," says Matt Manning, product manager of electronics at McLaughlin. "Because semiautomatic gain is not the industry standard, some contractors are hesitant to try it."

For this reason, the G3 gives locators the option to use semiautomatic or manual gain adjustments—which is a more commonly used method of locating. The dual functionality allows locators to use semiautomatic gain on congested, urban jobsites where signal distortion is a common challenge, and the manual gain method when working in less congested areas.

Automatic depth and current measurement index (CMI)

Another feature that adds to the user-friendly nature of the G3 is the addition of an automatic depth and current measurement index. When the user is over a utility line, instead of having to manually press a button, the estimated depth and CMI will now be automatically displayed.

"The automatic depth estimate offers the user a nice interface. It's easier, its faster, it's more user-friendly," says Manning.

Compass

The G3 includes a new compass icon. The icon provides a straightforward visual representation of a utility's position in reference to the receiver. The compass icon simplifies the locating process by automatically calculating peak signal, and quickly informing the user the direction of the utility path making it easier to locate the entire line.

A locator for all markets, skill levels

The new features of the G3 focus on ease-of-use and upholds the standard of precision and accuracy for which McLaughlin tools are known. Users new to the locating profession will appreciate the streamlined design and simple interface; advanced operators have the option to capitalize on some of the industry's most advanced locating technology—all in one device. As with all McLaughlin locators, the G3 promises weather-proof durability backed by the three-year warranty.

McLaughlin is dedicated to its customers and delivering products that meet their needs," says Manning. "With the Verifier G3, we are responding to our customers' request for a simpler, quicker locator that maintained the current accuracy, durability and reliability of the Verifier product line.

The Vermeer by McLaughlin Verifier G3 is available now in all markets. To learn more about the Verifier G3 and all McLaughlin locating tools, visit mclaughlinunderground.com or contact your local Vermeer dealer.

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