

# PROBING TIMES

Information for the ENVIRONMENTAL, GEOTECHNICAL, GEOTHERMAL, EXPLORATION, and WATER WELL Industries



**Geoprobe**

[www.geoprobe.com](http://www.geoprobe.com)

HAD Inc. drilling manager, Todd Bromley, uses the Geoprobe® 7822DT combination rig to set a 2-inch prepacked screen monitoring well through 3.75-inch dual tube outer casing. HAD in Rittman, Ohio, also uses the 7822DT for geotechnical sampling, rock coring, downhole hammer drilling, and hollow stem augers. See page 7 for the version 3 enhancements to the workhorse 7822DT.

# Customer Service Plus 3230DT Equal Rapid Growth for Hawkston LLC



All of Hawkston LLC rigs, like this 3230DT, are equipped with automatic drop hammers and with high-speed rotary heads, ideal for advancing boreholes in consolidated bedrock formations (left). Hawkston utilizes split spoons with the automatic drop hammer to collect accurate geotechnical samples, including conducting Packer testings in order to measure the permeability of the ground within sections of boreholes (below). The 3230DT is also effective to advance hollow stem augers for installation of a monitoring well (bottom).



After a couple years working as a consultant alongside drilling companies, Cory Walker gained key insights into what consultants need and a deep understanding of the goals and challenges of working with subcontractors. In 2015, he decided to start his own drilling business focused on improving the customer experience through service. With a focus on quality, he launched Hawkston LLC with one employee and a Geoprobe® 7822DT.

"Staying small allows us to maintain an ownership-on-site philosophy," Walker said. "The cornerstones of our business are accessibility, transparency, and quality."

Being small doesn't mean Hawkston isn't growing. The company, focused on environmental investigations and geotechnical work, has added two Geoprobe® 3230DTs and grown to eight employees. In the past year they built a new facility with a 60X80-foot shop tall enough to stand up the 3230DTs.

"Three years ago it was just Cory and I and a 7822DT. That 7822DT built everything you see here," said Arnold Chapel, senior drilling manager, during a recent visit (referring to the new facility and 3230DTs).

Growth has been in part due to Walker's mindset from the start – create the best possible customer experience and maximize utilization. All of their rigs have high-speed heads to core rock and auto hammers. This has enabled them to compete for geotechnical projects in the Nashville, Tennessee,

area and expand their federal environmental work. The addition of the 3230DTs really amplified the business by enabling rock work. For Walker, the hydraulic head is the way to go for any rock coring.

**"To me, 275k for an auger/rotary only rig is a lot to pay for a limited unit versus the additional 55k for a multi-application capable 3230DT. That's a small amount based on the return," Walker said. "With the larger head and additional weight of the 3230DT we can now run 6 and 8-inch DTH hammers with larger API rods very efficiently."**

On a geotechnical investigation outside Nashville, Tennessee, Hawkston used hollow stem augers to advance to the top of rock while collecting split spoon samples with an auto drop hammer. Upon refusal, the borings were cored using a wireline system to a depth of 110 feet.

Other work has included using the DT37 system to a depth of 54 feet on a federal power generation plant to collect nominal 2-inch soil samples thru fat clay and weathered limestone.

Walker said his crews favor the side head clamp and telescoping/oscillating mast on the 3230DT. He also finds having water onboard, with the 150-gallon drop tank, a big advantage over the 7822DT. He intends to continue to invest in the latest technology in rigs, appreciating that Geoprobe® engineers continue to push the edge of development.

**"Who else has a building full of engineers that never stop?" Walker said.**



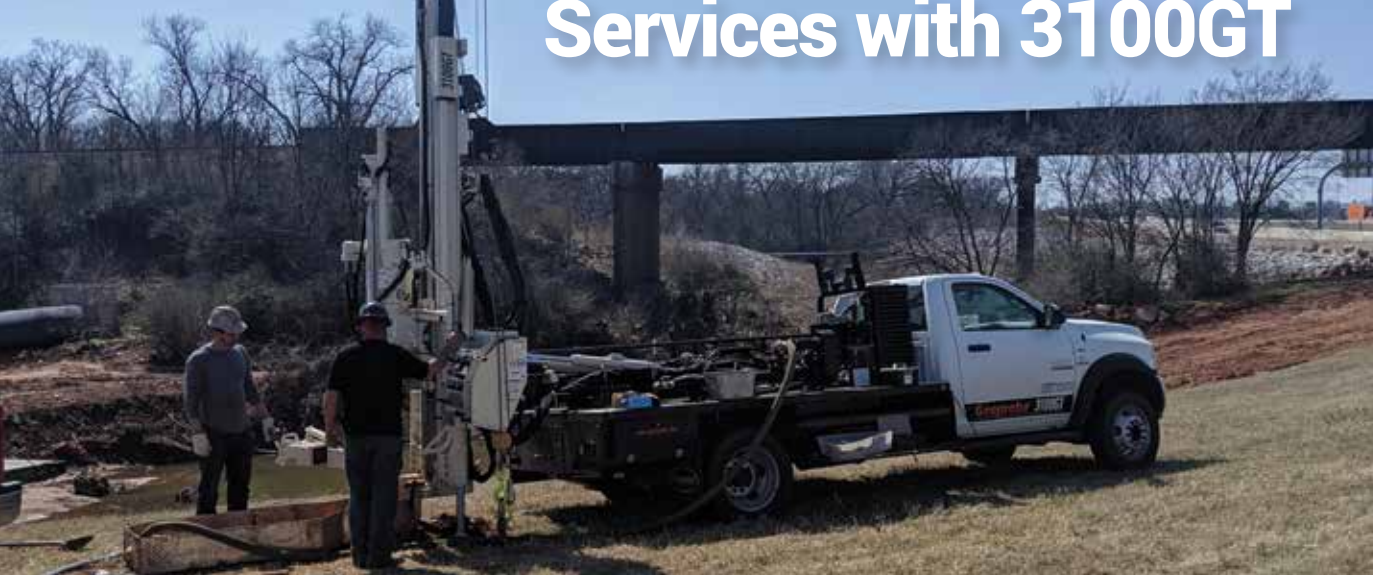
**WATCH THE VIDEO:**  
[geoprobe.com/3230dt](http://geoprobe.com/3230dt)

**Tier 4  
Final  
Engine**



**3230DT Combo Rig – Overview:**  
**Explore the features of this versatile rig.**

# W2 Engineering Offers Geotech Drilling Services with 3100GT



W2 uses the Geoprobe® 3100GT to complete an alignment for a running/jogging trail with bridges and retaining walls in central Oklahoma City.

**S**tarted in 2012 as a geotechnical and materials testing firm, W2 Engineering, Oklahoma City, subcontracted a lot of its drilling. According to Arvel Williams, president, they found they needed better control of their schedules and decided to move forward with drilling services both internally and externally. With more than 30 years of experience in the industry, the W2 management team began doing its due diligence reviewing all of the various manufacturers.

“What we found is that almost all of the manufacturers have not improved on their equipment over the past few decades,” Williams said. “Except for carriers, auto hammers, and moving to more modern engines, most of the mechanical drill rigs were the same design that was used 40 years ago. Almost all of them were above CDL, which, in this day and age, causes administrative issues. Where the rig was below CDL, it was usually underpowered for HSA drilling.”

However, the Geoprobe® 3100GT was set up to drill for geotechnical work and had the features and power they were seeking. From a management perspective, W2 especially appreciates the rig doesn't require a class A/B Commercial Driver's License (CDL) and the fuel mileage, resulting in significant overhead cost reduction.

**“Most rigs get 8-10 mpg or less. We have seen an over-the-road mileage of up to 15 mpg,” Williams said. “This is a reduction in fuel cost of 1/3. Combine that with maintenance on only one engine and we anticipate the operating overhead will drop significantly using this piece of equipment.”**

From an operations perspective, the driller values the hands-free controls along with the quietness of the 3100GT. The driller appreciated being able to actually carry on a conversation next to the rig when its drilling. According to Williams, at 40 feet, wet rotary with pump and rotation the sound level was 70-73 dB at the drillers station.

W2 recently completed a 21-hole alignment through some undeveloped areas of central Oklahoma City. The 3100GT performed SSA, HSA, and wet rotary drilling with both SPTs and Texas cones. Formations varied from alluvial terrace with fine saturated sands to hard sandstone with SPT blow counts of 50 for ½ inch.

**“We drilled to 70 feet with no issues,” Williams said. “The rig performed as promised. The secondary pump running auxiliary equipment was a big help when wet rotary drilling.”**

## Safe, Easy Operation Makes 3100GT Ideal for New Drillers, State Agencies

Cost-efficient mobilization, safety features (right) and ease of operation have made the 3100GT a valuable rig for training new drillers while providing the operating versatility and comfort desired by experienced drillers. State agencies and engineering firms especially appreciate the ease of operation and added safety.

- **Control panel on passenger side puts distance or line of sight between operator and on-coming traffic.**
- **Raising the mast with the winch system retracted, before telescoping up the winch reduces utility-line collisions. Winch is fully functional at all positions.**
- **Manual controls provide tactile feel.**
- **Electric controls provide for safe, hands-free operation.**
- **Control panel and driver side both include a safety E-stop. Safety pull cable between the control panel and the head adds another layer of safety.**



**LEARN MORE:**  
[geoprobe.com/3100gt](http://geoprobe.com/3100gt)



**WATCH THE VIDEO:**  
[geoprobe.com/3100gt-controls](http://geoprobe.com/3100gt-controls)



**3100GT – Control Panel:**  
*Discover why drillers love the passenger side hands-free control panel.*

## 3100GT Features You Should See for Yourself

Almost immediately after my return to Geoprobe® I was tossed the keys to our demo 3100GT and told to “go run it.” I was impressed to say the least. Four things stood out to me:



*Doug Koehler,  
Sales*

**EASY TO RUN:** After taking some time to familiarize myself with the controls I was quickly able to get set and start making holes. The control panel is laid out with efficiency in mind, common functions are grouped together making it easy to move several levers at the same time. Storage for common hand tools and hooks for hanging items are right there at the control panel and even a spot for the Interlocking Split Spoon on the breakout, keeping it right where it needs to be when you're ready to start taking blow counts.

**TRULY A COMBINATION RIG:** Whatever the job, this rig does it well. Perform SPT borings (augers & mud rotary), collect Shelby tube samples, take rock cores, or push CPT cones – none of these tasks are compromised. There simply are no trade-offs.

**QUICK TO SWITCH APPLICATIONS:** Once you tower up and set the drillmast, you don't move it thanks to the head side shift feature. Between the conveniently laid out control panel and the huge head side shift feature, switching from turning augers to using the auto drop hammer and back is EASY – everything just lines up.

**COMFORTABLE TO DRIVE:** It's almost like driving a pickup truck. It doesn't feel top-heavy going around corners, has plenty of power to keep up with traffic in town and on the highway, good brakes when needed, and has a big enough fuel tank that you don't have to stop at every gas station along the way.



**WATCH THE 3100GT DO CPT:**  
[geoprobe.com/3100gt-cpt](http://geoprobe.com/3100gt-cpt)



**WATCH THE VIDEO:**  
[geoprobe.com/3100gt-cpt](http://geoprobe.com/3100gt-cpt)



- **3100GT – CPT:** See how to switch from rotary to CPT – quickly and easily.

## Combination Drilling Rig Impresses Field Crews at Field Demos

### Sometimes Dirty is Best

While seeing a new machine all shiny and new in a convention center can be impressive, witnessing a machine doing the actual work reveals its true potential. Owners, operators, drillers, and consultants observed hands-on demonstrations of the Geoprobe® 3100GT and 3230DT getting dirty – completing actual tools in the ground work – at a recent Demo Day in Minnesota.

The demonstrations, which took place at a former sand and gravel pit with 4-inch asphalt cap, illustrated how the Geoprobe® drilling rigs successfully accomplish a variety of tasks.



Following an overview of the 3100GT setup and features, the action began with 3.25-inch HSA with pilot bit and split spoon sampling; mud rotary via NWJ rods, setting a 4.5-inch conductor casing with ADH utilizing a 100-gallon aluminum mud pan; and CPT anchor and push, using a solid flight auger to clear the top 5 feet of fill.

Moving to the 3230DT, the overview included the inspiration behind its production proceeding into CPT review and pushing 1.5-inch rod with solid point; exhibiting DT37 OTE sampling with split spoons; and demonstrating the ease of installing the top spline water swivel along with discussion of rotary application.

**An observer revealed their eyes were opened to one piece of equipment capable of completing a variety of drilling methods and samples, depending on material or objectives – direct push, hollow stem augering, mud rotary, CPT, and rock coring – commenting that they don't see any other piece of equipment in the industry that can do all of them well.**

Nearly 40 people braved the very cold day, many sticking around even after the demonstration concluded. Impressed by the compact size and power of the machines, many asked questions as they began to understand the alternatives Geoprobe® machines offer their business.

A participant praised Geoprobe® for being the only company innovating in an industry that has been stagnant for decades. A particular highlight was the 3230DT control panel, acknowledged for addressing a problem known as “drillers neck” caused by the driller always looking up. The swing-out feature of the panel means the driller doesn't have to look up as high to adjust the rod or cable, positioning themselves in a safer and more strategic place.

While the additional design and development put into Geoprobe® equipment wasn't lost on the group, one did admit that the innovation can cause growing pains – until they have a chance to be shown how it's done. For that individual, the training and customer service – both at the time of machine delivery and then awhile later – are key factors as the Demo Day solidified the possibilities afforded by a Geoprobe® machine.



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*to find out when the units will be in your area or to schedule a demonstration.*

## New Source Book Now Available!

### The Ultimate Reference for All Your Tooling and Machine Needs

Filled with an extensive OEM tools listing and comprehensive guide to Geoprobe® drilling rigs, the version 7 Source Book is the only reference you need. Check out the new geotechnical sampling section, information on 3.75-inch tooling system, 2.0-inch Slim and Premium Prepacks, CPT tool string diagrams, and learn a little Geoprobe® history along the way.



Geoprobe® 2.0 in. Slim Prepack  
220282  
for use with 3.75 in. tooling

Geoprobe® 2.0 in. Premium Prepack  
206644  
for use with 4.5 in. tooling



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**WATCH THE VIDEO:**  
[geoprobe.com/3.75](http://geoprobe.com/3.75)

## More and More, Customers Choose Geoprobe® 3.75-inch Rod for Variety of Applications

### Collecting SPT through Driven Casing

It's now possible to collect SPT data via split spoon sampler and automatic drop hammer within the same 3.75-inch driven casing. This system is applicable anywhere driven casing can be advanced with a Geoprobe® machine.

### Collecting Continuous Soil Samples

In combination with the DT37 soil sampling system, collecting continuous 2-inch diameter soil samples is a common practice.

### Installing Prepacks

Geoprobe® 3.75-inch tooling was designed in conjunction with the Geoprobe® 2.0-inch Slim Prepacks to create a more efficient method of installing 2.0-inch Schedule 40 prepacked screen monitoring wells. The 3.75-inch rods have a 3.75-inch OD and an ID of 3 inches. In short, it's an optimal casing combining ease of use for 2.0-inch Slim Prepack installation, minimal borehole size to maintain reasonable penetration rates, and a robust thread design. This durable and robust tooling system can be driven with Geoprobe® percussion hammers.

In business since 1965, Terracon focuses on geotechnical, environmental, materials, and facilities engineering. The exploration services group primarily supports geotechnical and environmental lines. With 140 drill rigs, Terracon has the largest drilling fleet of any geotechnical engineering firm in the U.S. This includes drill rigs, cone penetration, and direct push units of all sizes mounted on trucks, tracks, skids, buggies, and other all-terrain vehicles to access almost any site condition – even barges for overwater access.

## Terracon History Sets Foundation for Geotechnical Future

### Creating Efficiencies

With the advancements of in situ techniques, Terracon can more readily and directly measure engineering properties in the field then apply the results to their engineering work.

**“When we couple in situ testing with traditional methods of sampling and laboratory testing, we have a more complete picture of the subsurface and understanding of how the subsurface will interact with the built environment above and within it,”** Denton said.

This is a step up from solely obtaining disturbed/undisturbed samples from the field to bring in for laboratory tests. Terracon uses the Geoprobe® 3230DT with the ability to perform the traditional subsurface exploration with the additional capabilities to switch over and perform the more sophisticated exploration techniques such as CPT and DMT testing.

**“The efficiencies result when we can use the same piece of equipment to do both in field and react real time to the subsurface conditions we encounter to perform the most well-suited exploration program for those conditions,”** Denton said.

As Terracon explores more sites in any given area of the country, their understanding of the subsurface conditions encountered in those areas increases. The knowledge of these existing conditions allows them to do more analysis upfront without the use of intrusive techniques. This could be in the form of predictive and statistical analyses, which increases in confidence as the datasets become larger and more searchable with time.

**“We believe those who focus on these new capabilities and couple them with tailored exploration and site characterization programs will be the industry leaders,”** Denton said. **“With the long history of Terracon, we have ample amounts of existing data and have prioritized using it to supplement our traditional exploration methods to serve our clients and the profession. We will continue to expose this information in new and useful ways in the future.”**

*On a Texas job site, Terracon realizes efficiencies using the Geoprobe® 3230DT geotechnical rig to quickly switch from traditional drilling techniques to in situ techniques such as CPT.*

**T**erracon’s intrusive exploration and sampling methods include hollow stem augering, mud and air rotary, rock coring, and direct push. They also employ in situ testing such as cone penetration testing (CPT and SCPTu), downhole vane shear, dilatometer modulus testing (DMT), pressure meter testing, borehole shear, and packer testing.

At Terracon, intrusive methods are complemented by non-intrusive geophysical methods. Their highly qualified geophysicists routinely work with a broad spectrum of clients providing geophysical information for exploration, planning, design, locating, and evaluation of a wide variety of project sites.

These geophysical methods can also provide subsurface information in remote and inaccessible areas. When combined with traditional methods, site characterization of a project can be greatly improved.

**“There are many advanced techniques available to those in need of characterizing the earth. However, the ‘tried and true’ method of pounding a split spoon and obtaining an N-value is still prevalent in our industry. We need to change that,”** said R.L. (Levi) Denton II, national director-geotechnical site characterization services. **“Since we have a better understanding now – than we did 50 to 75 years ago – of expected conditions and the geology across the country, we should select the specialized tools best suited to analyze those expected conditions.”**

**Geoprobe® 3230DT Combo Rig**  
**Power • Safety • CPT**

### The Geotechnical Field of the Future

When considering the future of the geotechnical field, a top-of-mind topic is the safety of the men and women performing the work. Historically, the drilling industry has had a reputation and track record of being a “dangerous” industry. Terracon doesn’t feel this has to be the case with careful planning and attention to training and technique.

**“The newer in situ techniques have the potential to eliminate some of the rotation and more dynamic techniques associated with traditional exploration work,”** Denton said. **“I look forward to the day when the industry doesn’t injure another person in the conduct of our work.”**

As they pursue their vision of the future for the geotechnical/exploration industry, Terracon considers Geoprobe® a trusted partner both in terms of new technologies as well as tailoring machines to be operator friendly.

**“I see many opportunities for advancements in the fine details: ergonomics, well placed controls, efficiency, versatility of machines, and enhanced safety features,”** Denton said. **“Geoprobe® has demonstrated they are willing to partner with their customers and lead in these areas.”**



**WATCH THE VIDEO:**  
[geoprobe.com/3230dt-cpt](http://geoprobe.com/3230dt-cpt)

- **3230DT – CPT:** Watch how quick and easy it is to switch from rotary to CPT.



## Cordless and Cable CPT Transmission Options

State-of-the-art acoustic cordless CPT probe transmits data when preferable not to use a downhole cable. Alternatively, the standard cable CPT transmits data from the probe through two electrical wires and is still the preferred cost-effective, simple method of transmission.

At 18 bit quality – versus common 12 bit – the NOVA CPT means very small changes are more easily measured. This wireless system provides a constant stream of data to the surface through push rods and needs little adjustment when it's time to calibrate.



**LEARN MORE AT:**  
[geoprobe.com/cpt](http://geoprobe.com/cpt)



Whether it's in the field or at Geoprobe® headquarters in Salina, training is key to getting the most out of your CPT efforts with Geoprobe® machines. In order to maximize return on their CPT investment and ultimately meet customer needs, Kevin Whitla (right) of Olsson Inc. in Lincoln, Nebraska, trains with Troy Schmidt (left), following the purchase of their new Geoprobe® 20CPT Press.

## Productivity Push Leads EGS to 20CPT

With drilling services focused predominantly on infrastructure investigations – roadways and bridges – Environmental and Geotechnical Specialists Inc (EGS) in Tallahassee, Florida, began looking for ways to increase productivity. Key to their discussions was the need for lighter, faster options to supplement their current geotechnical drilling operations, conducting miles of soil borings.

**“We’re often completing borings on alignments for stretches of miles at a time. These aren’t always on even ground and the ground is often soft,” Myron Hayden, engineer, said. “We wanted equipment to quickly travel distances off-road – and we already owned a skid steer – so we chose the Geoprobe® 20CPT Press.”**

They now believe they are better equipped to conduct hydrodynamic testing, mapping changes in strata more accurately while assessing water dissipation and variances in permeability. The geophysical capabilities – such as testing electrical conductivity – with the seismic cone was another factor in choosing Geoprobe® tools and machines.

EGS has devoted a three-man team to the 20CPT Press. By focusing a driller, helper, and engineer on the equipment, EGS ensures analysis and procedures are kept consistent.

**“We’re very satisfied with the unit,” Hayden said. “We’re comparing it to results from some roadway new alignments and the data we have is good. A little more verification and we’ll turn it loose to augment drilling operations.”**

Once calibrated, Hayden envisions going from drilling 12 borings to drilling three and probing nine in order to speed up their processes. Long-term he hopes to be able to rely solely on probing, but the Florida Department of Transportation has expressed hesitancy in accepting strictly probe data. However, conversations have led the two entities to trade data in order for each to become more comfortable with its accuracy.

“I see positive things for it. It meshes really well with geophysics – ground proofing and calibrating geophysics. As we intertwine them better, we’ll use it more,” Hayden said. “I know that’s not something no one has done before, but I think we’ll be able to make it work well.”

## Geoprobe® No Stranger to CPT Advantages

With constant pressure to become more cost-efficient, engineers are opting to become more sophisticated in their sampling methods. For example, engineers are increasingly calling out CPT to better dial in the formation class, potentially saving on the foundation and ultimately the project cost. New engineers coming up the curve grew up using CPT and are naturally choosing to leverage its advantages. CPT advantages include:

### CONTINUOUS FORMATION DATA:

The continuous log reveals layers of dissimilar materials which can be missed with conventional drilling and interval sampling methods.

### REAL-TIME, ON-SITE INTERPRETATION OF RESULTS:

Logs can be used to obtain soil type, water table and soil parameters for engineering design.

### FASTER PRODUCTION:

Rates 1.5 to 3 times faster than conventional drilling and sampling result in more cost-effective exploration.



Troy Schmidt,  
CPT Specialist

All this means an upswing in CPT. And with more than 20 years experience, Geoprobe® is here to help. Whether you have years of experience or are just getting into CPT, we have the technical team to set you up right with:

- CPT MACHINE OPTIONS
- CPT TOOLING
- CPT TRAINING
- CPT SUPPORT

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for tooling or training to set up CPT operations or streamline practices.



**WATCH THE VIDEOS:** [geoprobe.com/20cpt](http://geoprobe.com/20cpt) [geoprobe.com/2060cpt](http://geoprobe.com/2060cpt)



• **20CPT – Overview:** Explore connecting to a 6712DT or attaching to a skidsteer like the Kubota SVL 75.

• **2060CPT – Overview:** See power for rugged terrain.

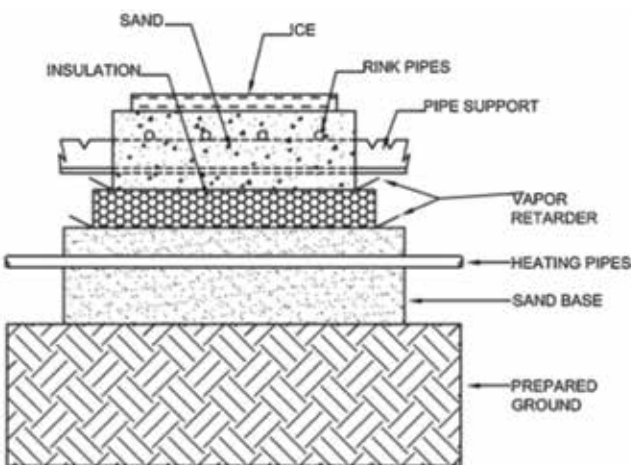


Gregg Drilling LLC conducts Macro-Core® sampling at the former Anaheim Ducks practice facility (left). They chose the Geoprobe® 7822DT for its narrow width, low track load on the ice surface (4.6 lb./in<sup>2</sup>), rubber tracks, and ease of operation with the wireless remote. The fact that it was only three months old was also an advantage, keeping dirt from falling off the tracks onto the rink (right).

## Gregg Drilling LLC Spends Time on Ice

Gregg Drilling LLC of Signal, California, spent time indoors this winter. But that doesn't necessarily mean they were staying warm. Todd Hanna, project manager, had their Geoprobe® 7822DT collecting soil cores under the ice rink at the former Anaheim Ducks practice facility to measure the soil temperature.

The rink features a sub-ice heating system to prevent frost build up under the rink floor. According to Hanna frost under the floor would eventually cause heaving of the rink. The temperature of this heating system is automatically regulated between 38-40 degrees Fahrenheit, but this particular system was not functioning correctly and needed to be replaced.



Often ice rinks are built on concrete slabs, but it is not necessary. This ice rink was built on a soil base.

**“Our soil core sampling discovered sub-freezing conditions down to ~15 feet, and around 40 degrees at 22 feet,” Hanna said. “Once the ice is thawed, heaters will be brought in to thaw the ground before the repairs are done.”**

Because of the unique nature of the project, communication between crew members Hanna; Sean Lance, operator; and Dejuan Ward, helper, became a key to success.

**“All-in-all it was a neat project that had some safety challenges,” Hanna said. “Most of the safety challenges were anticipated, but some were not, so adjustments and crew discussions were had.”**



The spacing between the piping was very close to the tooling, so drive caps were wedged in between to spread the piping apart (left). The ice was melted by the rink staff with the use of warm water and a wet-dry vacuum to expose the polyethylene refrigerant piping. Gregg Drilling LLC had to keep the water hose elevated or moving to prevent melting grooves in the ice (below).



## THE BEST VERSION YET: 7822DT Builds on Tradition of Excellence

Known for providing power and versatility to tackle difficult site conditions and exceeding your subsurface sampling expectations, the Geoprobe® 7822DT V3 builds upon this tradition with elevated efficiency and minimized maintenance.

### 7822DT V3 Enhancements

**TIER 4 POWER:** Experience the power you need – when you need it – and the operating and fuel efficiency you require with the hydraulic, load sensing system.

**COOLING:** Complete high-duty cycle operations such as coring, augering, or tracking long distances when operating in elevated ambient temperatures.

**STABILITY:** Use the rear blade to transport a drop rack tool carrier when desired while the wider tracks and shifted center of gravity better facilitate stability on unlevel terrain.



**Tier 4 Final Engine**

LEARN MORE AT: [geoprobe.com/7822DT](http://geoprobe.com/7822DT)



# Variety Key to Business for Cenozoic

With a bachelor's degree in geophysics from the University of California Santa Barbara, Jeff Harra's interest in mining geology, geologic hazards, and equipment design inspired him to develop Cenozoic Exploration in 1993. The Altos, California, company specializes in limited access drilling and sampling for geotechnical and environmental industries and became Cenozoic Exploration LLC in 2018.

The newest addition to their fleet of rigs is a Geoprobe® 7822DT combination rig equipped with auto drop hammer with 140-lb. slug for ASTM sampling. In addition to hollow stem auger drilling and the auto drop hammer SPT sampling, they offer rotary wash, mud rotary, direct push DT22, Macro-Core®, and in situ water sampling.

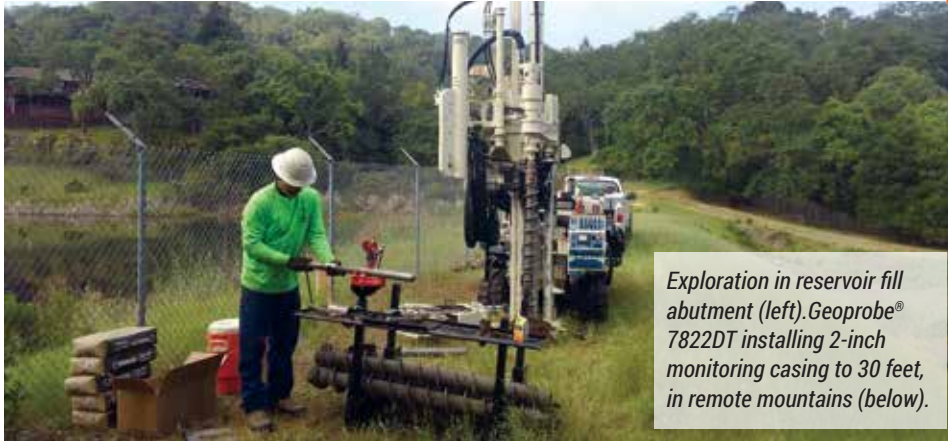
"This is our preferred rig for installation of groundwater monitoring, vapor extraction, and shallow domestic wells," Harra said. "We have three independent specialized tool racks that are carried to the boring locations and transport it to sites with our 2014 International 7400 4X6 semi tractor and Gatformade kingpin gooseneck air brake trailer, which makes us California Air Resources Board compliant and tier 4 compatible."

Since adding the machine in spring 2018, Cenozoic has completed a variety of projects from rotary borings, with sampling to 80 feet, to domestic water wells to 150 feet – all producing drinkable water – with 6-inch tooling, rotary wash. Their deepest push boring has only been limited to 55 feet by their customers need.

**"Between direct push projects, we are keeping the 7822DT very busy with geotechnical work, hollow stem auger with detailed sampling, modified California, and SPT," Harra said.**

Harra's interest in geophysics and equipment design led him to design and build his own hydraulic portable machine and a crawler tractor mounted drilling rig, yet he appreciates the added capacity for their company brought by the 7822DT.

**"I have 26-years experience with many rigs and I am very happy with our 7822DT," Harra said.**



Exploration in reservoir fill abutment (left). Geoprobe® 7822DT installing 2-inch monitoring casing to 30 feet, in remote mountains (below).



**WATCH THE VIDEO:**  
[geoprobe.com/7822dt](http://geoprobe.com/7822dt)

**Tier 4  
Final  
Engine**



**7822DT – Overview:** Explore the enhanced features of the version 3 rig.

## TRADE-INS WELCOME: Turn Your Old Equipment, Into New Equipment

Did you know that Geoprobe® is open to taking trade-ins of Geoprobe® – and even non-Geoprobe® – manufactured machines toward the purchase of new equipment?

Trading-in equipment can have many advantages over trying to sell yourself:

1. Reducing dollar amount that needs to be financed for purchase of new equipment.
2. Most states only require sales tax to be paid on the difference between price of trade-in and the new piece of equipment being purchased.
3. Possible savings in capital gains tax.
4. You can continue to use your trade-in until the new unit arrives.

To evaluate and determine a trade-in value we need 4-6 current photographs of the unit preferably with the mast up, current hours, and serial number.



Geoprobe® 7822DT rotary wash drilling to 150 feet with 4.75-inch tri-cone (left). Exploration on top of fill edge with hollow stem, auto drop hammer, modified California samples and direct push Macro-Core® sampling to determine fill/native and native/sedimentary formation contacts (center). 7822DT hollow stem exploration for proposed sidewalks and road shoulder investigation on steep bank (right).



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Please consult your accountant to review all possible advantages of trading-in equipment.





# Atlantic Testing Expands Customer Base

*The slope along the Moses Adirondack transmission line is no deterrent to the geotechnical investigations conducted by Atlantic Testing Laboratories Limited (ATL). Two Geoprobe® 7822DTs were used to complete 850 soil borings, 30 to 50 feet deep with four-point soil resistivity tests at more than 100 holes. The addition of the 7822DTs to the ATL fleet have made them more competitive in the electrical transmission line drilling market.*

**D**iversity is a driving force for Atlantic Testing Laboratories Limited (ATL). From diverse office locations to services, ATL has found stability and growth to serve customers in New York and New England for 52 years.

“We are extremely diversified, and have experience providing services for projects of varying complexity and magnitude,” Eric VanAlstyne, corporate development manager, said. “Our goal is to provide the most economical solution that will satisfy the project requirements while meeting the required project schedule.”

From any of their 10 offices, the full-service engineering support firm offers subsurface investigations, water-based investigations, geotechnical engineering, environmental consulting, construction materials testing and special inspections on soil, concrete, bituminous asphalt, steel, masonry, EIFS, wood, and fireproofing materials; nondestructive testing; field and batch plant inspection; precast and prestressed plant inspection; shop inspection for structural steel fabrication; petrographic analysis of concrete and aggregate; ground penetrating radar; vibration monitoring; dynamic pile testing; and thermal conductivity testing.

For ATL, the Geoprobe® 7822DT offers them the reliability, value, and ease to operate and maintain required by their lengthy list of services.



**“We like having the ability to direct push and drill conventionally in one unit. The small footprint allows us to get into tight spaces,”** Tim Gavin, drilling operations manager, said. **“The low cost of mobilizing and demobilizing an off-road drill rig without needing a lowboy tractor trailer is cost-effective. Having the ability to store it in enclosed trailers to protect it from the elements is very beneficial.”**

The wide range of Geoprobe® 7822DT rig benefits have helped to diversify the ATL customer base as well.

**“ATL has become more competitive in the electrical transmission line drilling market,”** Gavin said. **“Expanding our fleet by adding these Geoprobe® combo rigs has allowed us to work with clients we hadn’t worked with previously.”**

ATL was founded on the premise that providing a quality service requires integrity, honesty, commitment, and dedication. Those core values have cemented ATL’s position as a trusted and valued engineering partner on thousands of projects. One recent project that stands out is the New York Power Authority Transmission Line Project (Smart Path), located in St. Lawrence and Lewis counties in New York.

**“We performed subsurface investigation services, which entailed advancing 850 soil borings, to an estimated depth of 30 feet to 50 feet, utilizing hollow stem augers or flush joint casing,”** Gavin said. **“We performed four-point soil resistivity tests at each boring location. Two Geoprobe® rigs were utilized, spinning 3-inch casing and coring. On more than 100 holes we used NQ wire line techniques.”**

ATL’s geotechnical investigations served to support the design for the replacement of more than 800 wooden transmission towers along the 86-mile-long Moses Adirondack transmission line in order to provide system reliability. ATL also provided the soil laboratory analysis of the samples obtained.

*Offering both environmental consulting and contracting services, Environmental Works Inc. (EWI) undertakes multi-faceted projects with the ability to be flexible and cost-effective when planning and implementing projects. Frequently emergency response calls – a large component of their business – lead to investigation, which lead to networking that builds business. One area benefiting from this type of networking is their drilling department.*

*Paul Feld, drilling manager in EWI's Kansas City office, has been with the company for 16 years and has seen staff grow from 35 to more than 225. Trevor Lowry is a geologist in the drilling department. Other drilling team members include Aaron Stephens, Bill Platt, Levi Cope, and Daniel Yoakum, EWI drilling department operations manager.*

*"Part of our growth is a result of our culture which fosters an entrepreneurial spirit in our teams," Jason Smith, EWI president, said. "Our whole drilling department has thrived in this culture of [success based on ability]. We believe 'the best people deserve to be surrounded by the best.'"*

*The drilling department completes a range of services, including direct push, geotechnical, auger, air rotary, and sonic. To facilitate the company's vision of being the "Midwest's premier environmental consulting and field services firm, recognized for excellence and innovation," EWI has offices in Kansas City; St. Louis; Denver; Tulsa, Oklahoma; Springdale, Arkansas; Memphis, Tennessee; two in Illinois; and one in Springfield, Missouri.*

## EWI's Entrepreneurial Spirit Soars with Geoprobe® Sonic 8150LS

To complete primarily environmental, geothermal and cathodic drilling, EWI's Springfield office started with two Geoprobe® 6620s. As business grew, they added a 7822DT.

**"The 7822DT has 25 percent more power, yet it still fits into our gas station sites and goes under canopies without issues," Yoakum said. "The oscillating mast is great for uneven surfaces and I've got the pull-back power to pull 50 to 60 feet of dual tube."**

The bulk of EWI Springfield's business revolves around environmental sampling and installing monitoring wells for contaminated gas stations. They also work on old industrial sites and on pipeline projects determining depth of contamination, identifying extent of soil and water infiltration, and cleaning up contamination.

With the addition of a Version 3 7822DT, their four Geoprobe® combination rigs are sometimes out working seven days a week.

The 7822DT V3 offers additional advantages.

**"We can track longer without overheating the hydraulics, which is really important when working on pipeline projects in 90-degree weather," Yoakum said. "Sliding the center of gravity up and not needing the tool rack to balance helps a lot in swampy environments."**

Yoakum appreciates Geoprobe® customer service and headquarters being close to home.

**"We like to use HPT to cross section sites, but in southeast Missouri we don't have ideal geography to do Direct Image®. Dan [Pipp] and Ben [Jester] are always finding new ways to get the results we were originally going after. Essentially we break it and they find a way to make it better," Yoakum said.**

*One of the things EWI likes about the sonic is being able to install several feet of sand pack inside the drill rods and vibrating the tool string back out, giving them a good sand pack and keeping the mud out.*

### Geoprobe® Sonic Enhances EWI Growth

While attending a Geoprobe® Open House, Yoakum excitedly witnessed the Geoprobe® rotary sonic quickly and efficiently drilling and installing a well. He has wanted one ever since. So this spring he embraced the EWI entrepreneurial culture and made the case to include sonic services.

**"Clients in the Midwest don't have a lot of options for sonic work and dislike the cost of mobilizing sonic machines from other states. So I convinced the company we could make a name for ourselves in sonic drilling," Yoakum said. "We have three months of work lined up for the sonic. It took two months to do that."**

Recently Yoakum returned to a site where mud, air, and auger had all been troublesome. The geology goes back and forth from dolomite, sandstone, clay, mud, and so on for about 150 to 165 feet to where competent rock exists.

**"The sonic method cut like butter. Traditionally to get to 120 feet and build a well at this site was a two-day process. With the sonic we were able to get the well drilled and installed in 12 hours, with zero issues," Yoakum said. "This ended up saving our client several thousand while keeping waste cost to a minimum."**

### Born to be a Driller

Yoakum's entrepreneurial spirit sparked during his youth. Cutoff fatigues and tank tops were his uniform of choice working summers for his father's "accidental" drilling company.

**"I always had marks on my arms from slinging rods," Yoakum said. "Drilling is in my blood."**

His father installed a gas well to heat his shop. Then the neighbor wanted a well, and then their neighbor wanted a well. Eventually Yoakum's father sold his excavating business to focus on wells.

**"To this day, my favorite thing to do is put in a water well – I like to see water coming out of the ground," Yoakum said.**

And while Yoakum has been working to expand EWI's drilling services business, that hasn't been the only thing growing.

**"Now I have my own little boy, Wyatt, and I hope he's a driller too," Yoakum said.**

# GeoTek Alaska Sonic Succeeds at Subzero



## Once Upon a Cold, Dark Day

Using a Geoprobe® 8150LS rotary sonic, GeoTek Alaska drills at -38 degrees Fahrenheit in alluvial sands and gravels of the Tanana Basin near Fairbanks, Alaska. The 8150LS was mobilized, complete with rod handler and GV5 50K sonic head, in a 40-foot container. Project scope was to investigate the distribution of permafrost and install well clusters to evaluate vertical hydraulic gradients. Site drillers valued the centerline side shift of the head to efficiently collect large volume, high-quality samples while the rod handler provided additional safety and ease.



## Layne Takes Sonic Skiing

Layne Christensen a Granite Company, Indianapolis, Indiana, had their Geoprobe® 8150LS at work on the ski slopes in Telluride, Colorado. They encountered -10 to 20-degree temperatures and snow while at 8750-foot elevation. Overcoming tight locations, they completed 12-inch sonic drilling of 8-inch dewatering wells in an excavation at base of ski hill in town. The water table needed to be lowered to put in parking garage elevator.

Gregory Halliday, operator, who said he spent every Sunday skiing, named the machine "The ATM", commenting, "the unit is a flat out moneymaker!"



## Need a Rental Machine? Call Geoprobe®

More and more, Geoprobe® is being asked "do you guys rent equipment?"

The short answer is "yes," Geoprobe® does rent equipment. We understand there are times when you need additional equipment and we are here to help.

For our customers in the Florida area, we now have a 7822DT combination rig dedicated for rental housed at our Southeast Service Shop in Ocala, Florida.



*7822DT rental available from Florida Service Shop while you're in for repairs.*



5801 SW 6th Place, Ocala, FL 34474

**CALL GEOPROBE®:**  
**785-825-1842**

*to discuss your needs, whether it is a grout pump or a sonic unit.*

**CALL FOR INFO:**  
**352-854-1780**



# Sonic Secures Pot of Gold for M&W Drilling



M&W Drilling (MWD) uses the Geoprobe® 8150LS sonic rotary rig to complete 300 to 400 6-inch holes, 20 to 30 feet deep, to install 2-inch PVC wells for a dewatering project in Denver (above). MWD has also used the 8150LS to obtain continuous soil and rock core samples to depths of up to 700 feet (right).

**R**ather than continue turning down job requests because they didn't have a sonic rig, M&W Drilling (MWD) in Knoxville, Tennessee, decided two years ago it was time to get into sonic drilling.

"A lot of business kept floating by and we finally decided we had to go that way," Firas Mishu, president, said. "The rig stays pretty busy and now we're thinking of buying another one."

The rig was kept busy for a quarter of the year on a dewatering job in Denver. The shallow water table at the site required dewatering prior to excavation work. The easy maneuverability of the track 8150LS enabled a lot of production for the client. MWD completed 300 to 400 6-inch holes, 20 to 30 feet deep, installing 2-inch PVC wells.

**"The tracks and 10-foot stroke resulted in quick, fast, productive work,"** Mishu said. **"The rig held up great for three months in the cold Denver weather."**

Before purchasing the Geoprobe® 8150LS, Mishu said they were turning down one sonic drilling job per month. Now that the market is aware they have the 8150LS, they're flooded with sonic job requests – an average of one per week. So much so they've been renting a second machine four to five months of the year.

**"The best feature of this rig is that it makes money – which means it's efficient,"** Mishu said. **"The second best feature is that it's made by Geoprobe®. I had heard stories of sonic rigs with so many problems, but I've never had a major problem. And if I do have a minor problem, Geoprobe® service is quick to respond. I don't have a lot of down time with this machine."**

The Geoprobe® 8150LS rotary sonic rig is just one in a fleet of 16 rigs. MWD's sonic, air/mud rotary, hollow stem auger, direct push, and core rigs have served more than 500 environmental engineering, remedial clean-up contractors, and consulting firms. Begun in 2004 as a partnership, Mishu is now sole owner of MWD. For the past three years the company has focused on environmental and geotechnical markets.

**"I had five other Geoprobe® rigs before buying the 8150LS and knew the Geoprobe® service was great,"** Mishu said. **"Even with competitors continually trying to sell me their sonic rigs, if I buy another sonic, it will be a Geoprobe® because the service is great."**



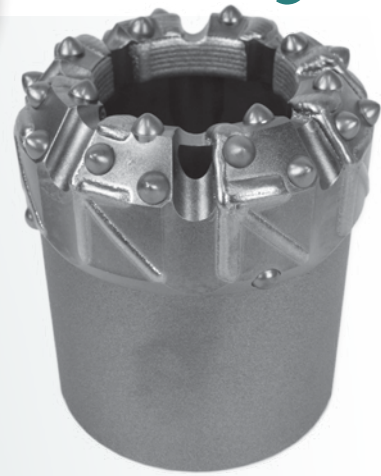
**WATCH THE VIDEO:**  
[geoprobe.com/8150LS](http://geoprobe.com/8150LS)



• **8150LS – Side Shift:** Explore the features such as the centerline side shift.



**Laser Coated, Lasts Longer**



## Carbide Sonic Bits

*What looks like small weld beads on the bit are a carbide material precisely applied to not only the leading face, but also the outer and inner gauge where bit wear commonly occurs.*

Throughout the years Geoprobe® has accumulated feedback on how sonic bits wear during their lifetime. Our tooling engineers took this information and **strategically placed carbide material along prevalent wear patterns on the sonic bit in order to reduce wear.**

The Computer Numerical Control (CNC) laser applies a flowable powder comprised of a proprietary blend of spherical carbide elements mixed with a Cobalt binder. Injected directly into the beam of the laser, the powder forms an ultra-hard deposit on the bit. Significantly harder than the overall bit body material, the carbide material slows down the rate of wear on the bit body.

## Why Choose Sonic?

Handling tough site conditions with one machine while preserving the option for sampling and setting wells often calls for a sonic rotary rig. The capability of quickly providing continuous, undisturbed core samples to impressive depths is unmatched.

**"Sonic drilling has grown in popularity largely because it can be applied to a broad spectrum of applications,"** Mike Carlin, tools engineer, said. **"It can be successfully utilized in such a broad scope of drilling conditions – hard rock to soft sediments. This type of versatility has helped grow the industry to what it is now."**

Geoprobe® 8150LS offers added advantages to increase efficiency and safety, such as:

- **powerful GV5 50K sonic head**
- **centerline side shift, eliminating need to move mast or machine to collect samples**
- **rod handler, reducing injury and fatigue**
- **mobilization in a 40-ft container**
- **14-inch double breakout wrench with 13,500 ft-lbf of torque and 9-inches of vertical travel**

### CONSIDERING SONIC? CALL GEOPROBE®

- **New and used sonic rigs to match your price point.**
- **Sonic experts ready to train your field teams.**
- **Geoprobe® service support.**



**CALL GEOPROBE®:**  
**785-825-1842**

*We will introduce you to a Geoprobe® sonic owner to work your next sonic project.*



**WATCH THE VIDEO:**  
[geoprobe.com/4.5-sonic-hd](http://geoprobe.com/4.5-sonic-hd)



Geoprobe® 4.5-inch Heavy Duty (HD) sonic drill rod (front) and traditional sonic drill rod (back).

- **HD Sonic Rod Durability:**
- **Learn about their strength and longevity.**



## Thank you from Team Geoprobe®

Your ongoing loyalty to Genuine Geoprobe® products empowers our team of research and development engineers to continue their innovation of industry-leading machines, tools, and consumables for the geotechnical, environmental, exploration, geothermal and water well industries.

### JOIN US FOR A FACTORY TOUR

Call us to schedule a factory tour. Come expecting to see new products, learn new things, and make new friends. If you'd like to operate a machine or tool, we will arrange that too. We now have non-stop regional jet service from Chicago's O'Hare International Airport direct to our Salina, Kansas, facility.

### AT GEOPROBE® WE FOCUS ON NEW TECHNOLOGY SO YOUR COMPANY HAS GROWTH OPPORTUNITIES

Encountering a field challenge? Call Geoprobe®! We like solving problems. Often when a customer calls Geoprobe® to discuss a need, we are able to respond with a solution we've been developing.

**Tier 4 Final Engine**

### Tier 4 Rigs Available

Our engineers continue to innovate ahead of the compliance curve so you have the machines you need out in the field. Throughout the magazine, look for the T4 symbol for machines which already meet the regulations.

**3230DT • 7822DT • 8150LS**

**CALL TODAY: 785-825-1842**  
to discuss your drilling rig needs.

## The Face Behind the Friendly Geoprobe® Greeting

She is the familiar voice you hear when you call the main Geoprobe® number. Whether to order tooling, work through a service challenge, or talk about a new machine, she cheerfully greets customers and directs the call to the most knowledgeable person. For many, Lori Christensen is the voice of Geoprobe®.

Christensen came to Geoprobe® 13 years ago. She lived on a buffalo and cattle ranch in South Dakota and moved 24 times before landing in Salina, Kansas. Shortly after expressing to friends an interest in working outside the home, Tom Omli, director of sales and marketing (who she knew through school and church), called Christensen and she excitedly joined the Geoprobe® family.



Sammy Sirhan (left), Superior Environmental Remediation in Mishawaka, Indiana, was eager to meet Lori Christensen (right) while he was in Salina, Kansas, for Direct Image® training.

### You Can Hear the Happy in Her Hello

Through the years she has had many titles, serving as receptionist, in distribution, and in marketing. To this day she continues to wear a variety of hats – such as keeping the sales team safely on the road, arranging lunch details for training groups, shipping introductory materials to new customers, and handling service part returns – all with a smile. But her number one focus will always be the phones.

**“We have a very large, diverse group of people that we serve in this industry, and it is truly a pleasure to get to interact with them on a daily basis,” Christensen said.**

When she's not helping Geoprobe® customers, she can be found with family – her girls being most important to her. She splits her time between Salina with oldest daughter Kaitlyn, who is married with a 3-month old daughter; with Kyla who lives and works in Ohio; and Kodee who is a sophomore at Washburn University.

“Grandma’ is my new favorite title,” Christensen said.

## SELL YOUR USED MACHINE ON THE GEOPROBE® WEBSITE: [geoprobe.com/used](http://geoprobe.com/used)

Do you have equipment sitting around the yard that you'd like to find a new home for? Let Geoprobe® help you by listing your equipment on the Used Machines page of our website.

The Used Machines page gets more than 50 visits per day on average. That's more than 50 pairs of eyes from all over the world specifically looking for used drilling and direct push machines and other drilling-related equipment.

Visit our site and you will see all brands and types of equipment listed. This service is just one more way

Geoprobe® is trying to help our clients in the drilling industry and only takes three easy steps. Your posting will be reviewed and added to the page free of charge.



**1. BROWSE USED MACHINE PAGE:**  
[geoprobe.com/used](http://geoprobe.com/used)

- 2. CLICK:** “Add a New Listing”
- 3. COMPLETE:** required information

**CALL GEOPROBE®:**  
**785-825-1842**  
if you have any questions or need assistance getting your equipment listed.

# Rigs Renewed and Running Thanks to Geoprobe® Service

“ We have two machines that look and act like they are brand new, and the total cost for both refurbishments was less than one newer model machine. We have had both machines out working and have been quite pleased thus far with the outcome. ”

– Nate Thompson, Partner  
Environmental Management Associates  
Farmingdale, New Jersey  
factory refurbish of 2000 66DT and 2007 7722DT



## Geoprobe® Service Offers Multiple Options

The goal of Geoprobe® service is to provide the best equipment service support in the drilling industry. Understanding the difficult job our customers face servicing drilling rigs when they are busy performing field work, the service centers – in Kansas and Florida – offer several different options to meet your needs.

**SERVICE:** Change fluids/filters, lubricate slides, grease pivot points, check track tension, charge hammer.

**REPAIRS:** Anything beyond standard service. Slide changes, hoses changes, cylinder rebuilds, gauge replacement, hammer replacements, tracks replaced, pump rebuilds, gearbox rebuilds, etc.

**SERVICE AND REPAIR:** Fluids and filters and a repair of any kind to the machine.

**SERVICE, REPAIR AND PAINT:** Complete fluids service, agreed upon repairs, and as much painting as can be done without tearing the unit all the way down.

### GEOPROBE® FACTORY REFURBISH\*:

Complete teardown, sandblast, paint, and building back up of a machine using all new slides, hoses and fittings, hydraulic pump, electrical components, new remote, rebuild hammer, hose carriers, rubber tracks, and more so the unit comes back looking and running like new. Essentially, it is like hitting the reset button on your machine's life.



Darren Stanley,  
Service Manager

**CALL GEOPROBE®:**  
**785-825-1842**  
if you have any questions or  
need service assistance.

\*Only completed at Geoprobe®  
headquarters in Salina, Kansas.

## Southeast Service Shop in Florida Keeps Customers in the Field



Preferred Drilling Solutions in Pinnellas Park, Florida, has found the Geoprobe® Southeast Service Shop in Florida to be an advantage for their business, including the service, repair and paint of a 7720DT in their fleet (left).



One year ago Todd Ewing and his family relocated from Kansas – bringing more than 10 years of Geoprobe® service experience – to open the southeast service shop in Ocala, Florida.

- One-mile from I-75
- One hour northwest of Orlando

From this conveniently located shop, he leverages his experience and continued connection with team Geoprobe® to help keep rigs up and running with:

- Specialty tools to service rigs efficiently
- Genuine Geoprobe® service parts

From general maintenance to major repairs, the shop has begun making a name for itself in the surrounding area with companies like Preferred Drilling Solutions (PDS) in Pinnellas Park, Florida.

The southeast service center – and especially Todd Ewing – has already become a valuable asset to the 20-year-old PDS. The employee-owned company focuses on environmental drilling, direct push, remediation, and added sonic in 2018. PDS has utilized the southeast service center for Geoprobe® sonic repairs and maintenance, 7822DT repairs, and a 7720DT service, repair, and paint.

**“Having Todd within a two-hour drive has been critical to our sonic program. He has done several repairs to keep us running on key projects,” Chad Campbell, president, said.**



Todd Ewing,  
Service Specialist



**CALL GEOPROBE® SOUTHEAST SERVICE SHOP: 352-854-1780**

to schedule your SE Service Shop appointment the next time you're in the area and your rig is in need of repair.

# DRILLMAX® DM450 Water Well Rig



## AVAILABLE NOW: Lightweight, Compact DM450 Water Well Rig

For more than 20 years DRILLMAX® has been providing drillers with the model DM450 rotary rig. Primarily utilized to complete residential water wells, commercial geothermal, and shallow cathodic protection drilling, the popularity of the DM450 product has been rooted in its combination of power while maintaining a relatively lightweight and compact design. Recently our engineers began an in-depth evaluation, reviewing and considering improvements on each aspect of the legacy DM450. The result is the all new DRILLMAX® DM450.

The new DM450 comes standard with a totally redesigned drillmast with 26,000-lbs of pullback and a tophead carriage that uses rollers instead of slides. A long list of additional improvements were incorporated as well — too many to list here. The goals for the NEW DM450 rig were simple: enhance current operator features, simplify manufacturing, improve serviceability, and reduce weight where applicable.



**LEARN MORE:**  
[drillmaxrigs.com/DM450](http://drillmaxrigs.com/DM450)



# CALL DRILLMAX®: 352-854-1566



**No CDL\*  
Required!**  
(\*Class A/B)

### Favorite Features on the DM250 Water Well Rig

*The perfect rig for 2 to 6-inch shallow water wells. The DRILLMAX® 250 can be set up with centrifugal or piston mud pump and development air, making this rig a smart choice for everyday use. Table assembly has clearance for 12-inch PVC casing and the holding fork and hydraulically operated adjustable breakout wrench make tripping out fast and safe.*

- Capable of getting in tight job sites without worrying about tearing up driveways or yards.
- Only rig mounted on a truck under CDL requirements that can handle 20-foot drill pipe.
- Carry up to 200-feet of 3-inch drill pipe on board and load rods with the single rod loader.
- The helper loads the drill pipe in the single rod loader using helper side controls to operate the jib and winch functions controls.

## DRILLMAX® DM250 Water Well Rig Earns Praise from Customers

“We love our DRILLMAX® 250 rigs. Currently we have ordered our fourth one and continue to grow. Works great whether you are drilling a 25-foot screen well or a 400-foot artesian rock well. Highly recommended!!!”

— Fred Gumienny Jr, Owner  
D&E Pump Sales & Service, Titusville, Florida

“The DM250 is one of our most productive and versatile rigs. We currently run two DM250 rigs in our fleet and use them in both our water well and environmental drilling department. We primarily use this rig to drill our 3-inch and 4-inch diameter wells and it does a terrific job. Its smaller size and lighter weight allow us to drill in some pretty tight locations. It does not require a CDL license to drive, which is a huge advantage. Operation is simple and therefore training an operator is easy. We really enjoy the DRILLMAX® DM250.”

— Merritt Partridge, Partner  
Partridge Well Company, Jacksonville, Florida



**WATCH THE VIDEO:**  
[geoprobe.com/DM250](http://geoprobe.com/DM250)



- **DM250 – Single Rod Loader:**  
Explore the industry unique feature.

# PFAS: Per- and Poly-Fluoroalkyl Substances

## Sampling Protocols and Issues

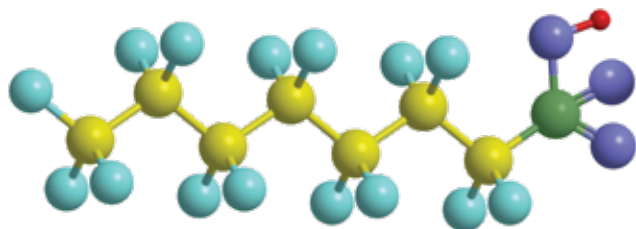
PFAS compounds have been “emerging contaminants” for a few years now. It seems this last year has reached a critical point for environmental investigation and sampling for this large group of fluorinated polymers. The number of calls we receive about sampling for PFAS has steadily increased during the last two years. Many groups and agencies have been releasing guidance documents about PFAS compounds and PFAS sampling protocols (see [geoprobe.com/PFAS](http://geoprobe.com/PFAS)).

### What are PFAS?

PFAS consist of a large group of fluorinated polymers used in many commercial and industrial products. This includes any of the Teflon® polymers used in common household products like your frying pan, PTFE plumber's tape, your Goretex-lined rain coat, or the water/stain

resistant coating on your carpet or couch. One of the primary concerns for these polymers relates to Aqueous Fire Fighting Foams (known as AFFF, AF3, or A triple F). The Department of Defense

(DOD) has used these foams to fight/control fires at air bases and also used in fire training. Many commercial airports and some municipal fire departments have also used AFFF. These fire-fighting foams contain several of the PFAS polymers, including PFOA and PFOS.



PFOS = perfluorooctane sulfonate, yellow - carbon, teal - fluorine, purple - oxygen, red - hydrogen, green - sulfur

### Helpful Links for Sampling

[www.astm.org](http://www.astm.org)

- American Society of Testing & Materials (ASTM) D6001 Standard Guide for Direct-Push Groundwater Sampling for Environmental Site Characterization.
- ASTM D6282 Standard Guide for Direct Push Soil Sampling for Environmental Site Characterizations.
- ASTM D6725 Standard Practice for Direct Push Installation of Prepacked Screen Monitoring Wells in Unconsolidated Aquifers.

### EPA Guidelines

The Federal Environmental Protection Agency (EPA) has set a Health Advisory Level for PFOA + PFOS at 70 parts per trillion – yes, parts per trillion. This advisory level is about 100 times lower than any previous maximum contaminant level set by the EPA. This means that the potential for cross contamination of samples by commonly used products during field sampling becomes a significant concern. These products range from the Rite-in-the-Rain notebooks, to Tyvek suits, sunscreen, bug spray, Teflon® liners of many sample bottle caps, and more.

### Geoprobe® Sampler Analysis and Advice

A few laboratories have started programs to verify whether many of these products are truly a significant concern for PFAS cross-contamination. Jennifer Field, Ph.D., at Oregon State University (OSU) leads one of the research teams. Geoprobe® submitted samples of our clear PVC soil liners and lay flat liners used for sonic soil sampling to OSU. Field's team analyzed the Geoprobe® soil liners for 24 PFAS analytes, including PFOS and PFOA. Field and her team are preparing to publish the results of their analyses soon. **Geoprobe® will provide links to the article on our webpage as soon as we learn it has been published.**

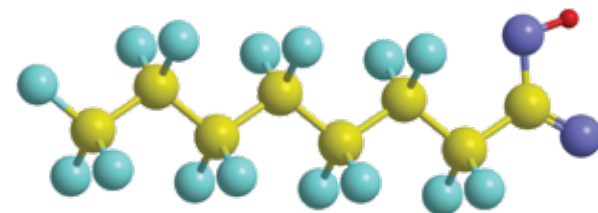
Preliminary results indicate all of the Geoprobe® soil liners are below the reporting limit for all 24 PFAS compounds for which they were tested. These results are for a single sampling event, so we get a snapshot in time about PFAS results for the liners.

Geoprobe® recommends you conduct periodic field rinsate samples of tools and soil liners during your PFAS sampling projects.

You must use PFAS free water provided by your laboratory for this purpose. Tap water or bottled water may have been in contact with PFAS containing materials such as Teflon® tape or PTFE containing pipe joint compound. Of course, use bottles (HDPE or Polypropylene) provided by your lab for the PFAS field rinsate samples.

The steel components of soil samplers and groundwater sampling tools do not contain PFAS compounds. Use of these tools for PFAS sampling and investigation following standard procedures is appropriate. Be careful to NOT use materials like Teflon® tape or PTFE joint compound on joints or fittings that will have sample contact. Don't use Teflon® soil liners or tubing in your sampling for PFAS. Use the clear PVC soil liners when soil sampling or HDPE or polypropylene tubing when groundwater sampling. The DOD has recommended the use of silicon-based plumbers paste and O-rings in place of Teflon® products. Also, the DECON 90 product contains PFAS components so use decon soap and water approved for PFAS sampling.

We are all coming up the PFAS learning curve. As the entire industry continues to learn about PFAS sampling, analysis, and remediation, updates and revisions to guidance documents and operating procedures will be issued.



PFOA = perfluorooctanoic acid



Wes McCall,  
Geologist PG



**LEARN MORE:**  
[geoprobe.com/PFAS](http://geoprobe.com/PFAS)

**NEW**

## DI Viewer, Acquisition V3.3 Release

DI Acquisition V3.3 Improvements – **FREE** Upgrade for Existing Users:

- Improved installation, which includes a code signing certificate within the installer security window. This shows our software (Viewer and Acquisition) is from Geoprobe® – a trusted source.
- The installer checks your system for the necessary .NET framework 4.6.1 required for proper operation.
- Addition of MIHPT-CPT, OIHPT-CPT, and OIHPT-G in the probe selection option menu, depending upon the mode of operation.

DI Viewer V3.3 Improvements – **FREE** Download:

- OIP multiple image display (see log on facing page).
- Modification of the observed fluorescence graph label on OIP logs to identify the image filter being used.



Geoprobe® Direct Image® has released the latest update on DI

software, available from:

[geoprobe.com/software](http://geoprobe.com/software)





## Using Hydraulic Profiling Tool (HPT) to Estimate Groundwater Specific Conductance

Geoprobe® HPT is becoming one of the most common direct push logging tools used in site characterization. An HPT port is now included on ALL MIP and OIP probes (Figure 1). That's right, it is no longer an option, it is there on every probe (each probe is also shipped with a blank plug, so if you don't want to run HPT, you can cover this port).

Our reason for including an HPT port on all probes is simple; HPT just gives so much information with minimal additional effort. With HPT you get a very good graph of injection pressure (a proxy for permeability), piezometric profile, and predicted water table. If the operator correctly performs a few dissipation tests during the log, HPT can be used to create a graph of estimated hydraulic conductivity for the saturated portion of the log.

We have recently added an additional post logging calculation to the DI Viewer that can be performed using the HPT and Electric Conductivity logs: estimation of groundwater specific conductance. This calculation can be made in clean sands and gravels (which typically exhibit negligible electrical conductivity). The bulk electrical conductivity of these saturated sands and gravels is

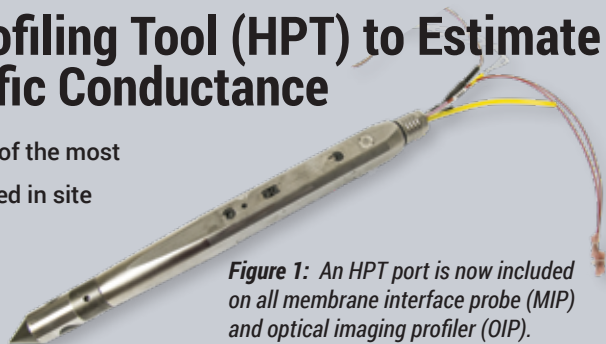


Figure 1: An HPT port is now included on all membrane interface probe (MIP) and optical imaging profiler (OIP).



Thomas Christy, Vice President

thus overwhelmingly influenced with the specific conductance of the pore fluid they contain. In these zones we can apply Archie's law to make our calculation. An algorithm to detect applicable zones and make this estimate of specific electrical conductivity has been added to the latest version of the DI Viewer.

The groundwater specific conductance (GW SC) can be an important parameter in site characterization. It can indicate the presence of industrial or oil field brines. It can also help us to understand where we encounter groundwaters from different sources. Using this estimate, we can know the expected specific conductivity of a groundwater before we sample. Another interesting use is to indicate where certain soluble remediation fluids have been injected. Whatever the purpose, GW SC is a very easy estimate to make, and if you are already running an HPT log, it's free.

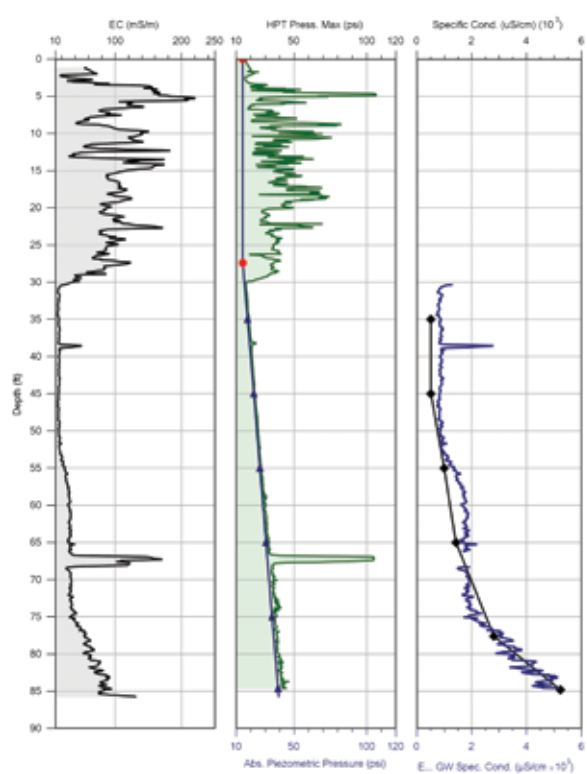


Figure 2: An example of estimation of groundwater specific conductance (GW SC) based on EC and HPT logs. When the HPT log indicates the presence of sands or gravels (green line), then EC (gray line) is used to estimate GW specific conductance (blue line in 3rd graph) in accordance with Archie's Law. The GW SC in this log ranges from approximately 500 to more than 5000 uS/cm.

An example of use of the groundwater specific conductance estimate can be seen in Figure 2. Note that in order to make this estimate, the operator must perform dissipation testing during the HPT logging process!

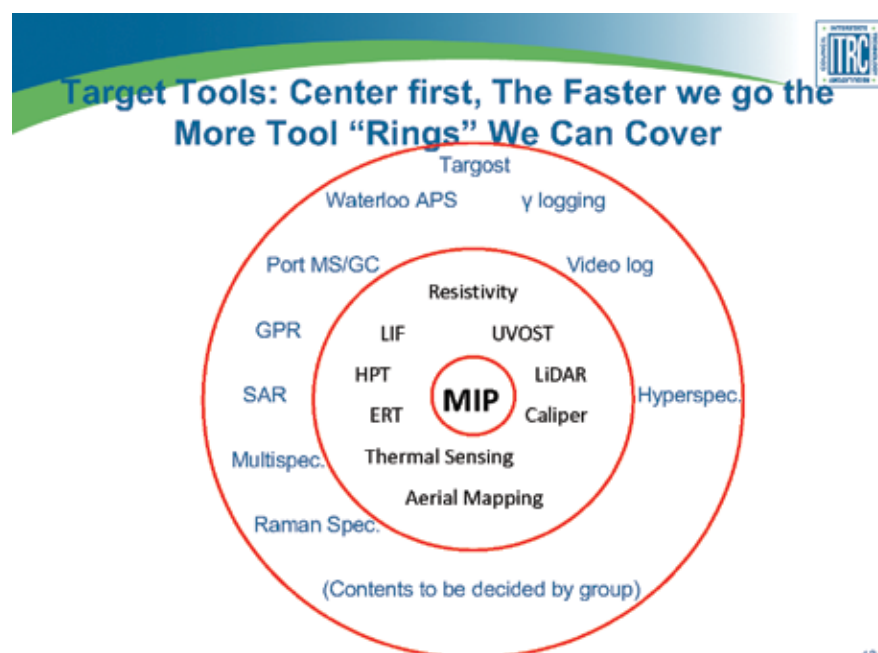
## Geoprobe® Participates on ITRC Team for Implementing ASCT

The Interstate Technology and Regulatory Council (ITRC) is a state led coalition working to encourage the use of innovative technology and methods to reduce the cost and expedite the cleanup of contaminated sites across the country. As of last year, all 50 states were participating in ITRC.

ITRC accomplishes its goals by establishing teams to work on selected technical and regulatory projects. The teams are led by state personnel and typically include Environmental Protection Agency, Department of Defense, Department of Energy, and private company experts through the Industry Affiliates Program. The teams work to develop and write guidance documents and develop training courses on the selected topics. The published Tech Reg documents ([itrcweb.org/Guidance](http://itrcweb.org/Guidance)) are well known and widely used by state and federal agencies and private consultants across the U.S. and beyond. The teams also develop in-person and online training seminars.

Geoprobe® joined ITRC in 2018 to participate on the Implementing Advanced Site Characterization Tools (ASCT) Team. This team – led by Alexander Wardle, remediation specialist of the Virginia Department of Environmental Quality, and Edward Winner, Ph.D., of the Kentucky Department of Environmental Protection – was established to develop guidance and training for regulators and private industry on the use of several new and innovative site characterization tools and methods. Often these tools and methods have been underutilized but show the ability to improve and expedite site characterization, often at a significant cost savings.

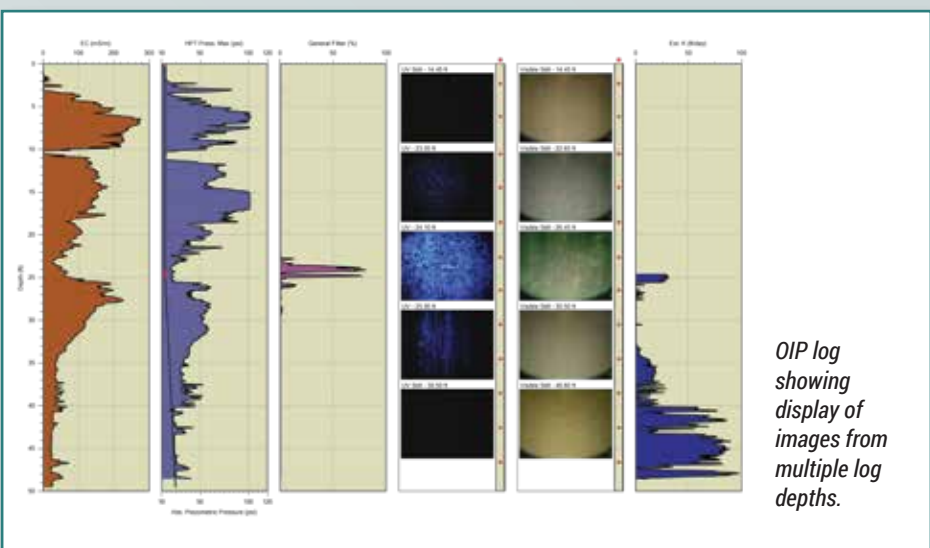
The ASCT Team, working under an expedited timeline, hopes to have the Tech Reg document published in 2020. Wes McCall, Geoprobe® geologist, has been working with the ASCT Team to assist with writing and reviewing sections of the draft Tech Reg document related to the direct push logging technologies. According to McCall, the broad technical and regulatory experience of the team members has helped to develop a detailed draft of the document. As of late March 2019, the team is working on the third draft of the ASCT document and anticipates having the draft final document completed by fall 2019. Later this year the team will also begin development of materials for in-person and online training for the ASCT.



This slide was used in one of the first ASCT Team meetings to suggest possible tools and methods to be included in the Tech Reg. Some of the technologies in the ASCT Teams program include surface and downhole geophysics, remote sensing, drone technology, and direct push logging methods. The membrane interface probe (MIP), hydraulic profiling tool (HPT), optical imaging profiler (OIP), and electrical conductivity (EC) logging are some of the direct push methods being included. The team used the MIP to start developing the outline to be used for writing about each of the tools and methods. The optical image profiler (OIP) was new at this time but was added to the list of technologies to be included.



**LEARN MORE ABOUT ITRC:** [www.itrcweb.org](http://www.itrcweb.org) also the ASCT Team ([itrcweb.org/Team/Public?teamID=79](http://itrcweb.org/Team/Public?teamID=79)) and joining ITRC through the Industry Affiliates Program ([itrcweb.org/IAP/IAP](http://itrcweb.org/IAP/IAP)).



OIP log showing display of images from multiple log depths.

# DT22 Detent Drive Head Helps Increase RAZEK's Efficiency

Founded in 2004, RAZEK Environmental LLC in Louisburg, Kansas, operates as a Geoprobe® direct push technology subcontractor. Using their 7822DT combo rig, they perform site assessments (soil and groundwater sampling), hollow stem auger drilling to install monitoring wells, and air-rotary rock drilling. Their air-rotary capabilities have carved out a lucrative niche market for the 15-year-old business.

**"We have completed many projects where traditional rigs could not access due to rough terrain or space limitations," Tony Poulter, owner, said. "Our clients appreciate our 7822DT can complete all phases of their projects to achieve successful delineation of soil and groundwater impacts with minimal disruption to their business operations. Adding this capability has set us apart in the local industry."**

RAZEK routinely uses the 7822DT to soil sample (Macro-Core® or dual tube) to refusal, then auger to set 8-inch casing, and use air rotary to drill into bedrock (6 inch diameter) to find groundwater and set monitoring wells.

In Kansas, RAZEK performs projects for the Underground Storage Tank (UST) program, which requires the dual tube soil sampling system. In the past six months they have successfully completed projects in Topeka, Kansas City, Wichita, Overland Park, Seneca, and Greensburg using DT22 and DT37. They have also used the dual tube system in other states on projects where the borehole collapses.

According to Poulter, their clients often need a soil sample of native materials beneath a UST basin that was filled with sand. The dual tube system enables them to quickly case the hole and collect perfect soil samples of the native clay beneath the fill sand.

When Geoprobe® released the new DT22 detent drive head, RAZEK was an early adopter. While the older version worked for many years, Poulter acknowledged the head would dislodge itself from the liner during retraction of the soil sample, causing them to pull the entire rod string and start over. Additionally, with the old-style drive head, RAZEK struggled with distorting the end of the liner when removing the head, making it difficult for the geologist to cut open the liners. To correct this, Poulter said they would cut off the top 3 inches of the distorted liner.

**"The new detent drive head has not failed to return a liner since we started using it last year. The detent drive head can be removed with a simple push of the button saving time and frustration for our clients," Poulter said. "We are all about providing the best samples for our clients as efficiently as possible. The detent drive head increases our sampling efficiency. When we can effectively provide our clients with perfect soil samples (within an unblemished liner), we are successful."**

A 25-year veteran of the industry, Poulter has relied on Geoprobe® to put out the best quality and most innovative tooling to make his business a success. He has worked for firms that use inferior machines and tooling, and for Poulter, there is no comparison.

**"I once was given a 'knock off' pull cap to use. During an extremely hard pull it broke apart and narrowly missed hitting me in the face," Poulter said. "I later determined that the 'knock off' was not heat treated. Since then my motto has been 'if it doesn't say Geoprobe®, it doesn't work!'"**

RAZEK uses the dual tube system in Greensburg where they continuously sampled from surface to 85 feet. With a continuous profile of the site geology, their client was able to visually determine preferential pathways for the migration of contaminants and collect precise soil samples at the most effective intervals.



**WATCH THE VIDEO:**  
[geoprobe.com/dt22-drivehead](http://geoprobe.com/dt22-drivehead)



**DT22 Detent Drive Head Use:**  
*Learn how this tool speeds up sampling.*

## Multiple Sizes of Spring Assisted Swivel Pull Caps Reduce Operator Fatigue

Control of the winch line tension by the springs in the cap creates natural alignment and prevents binding of threads – making threading and unthreading rods quicker.

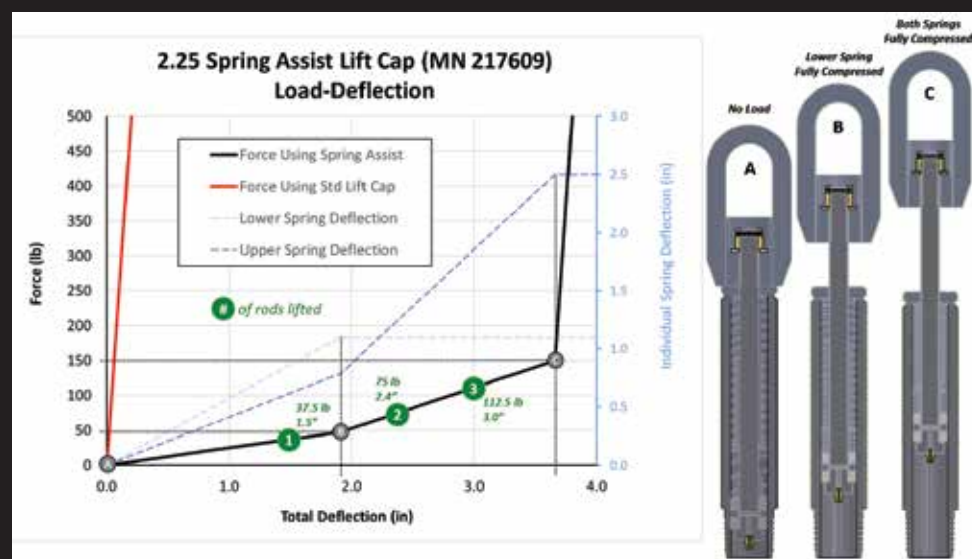
Internal springs of the pull cap bear the rod string weight, resulting in the operator physically lifting less weight and requiring less physical force to unthread rods – increasing safety.

All this reduces operator fatigue without losing any strength of the pull cap. The cap is still rated for 11,200-lbs. of pull and is designed so that even at full pull force, the springs are not affected or damaged.

Available in NWJ • AWJ • 2.25 Pin • 2.25 Box



**WATCH THE VIDEO:**  
[geoprobe.com/pull-cap](http://geoprobe.com/pull-cap)

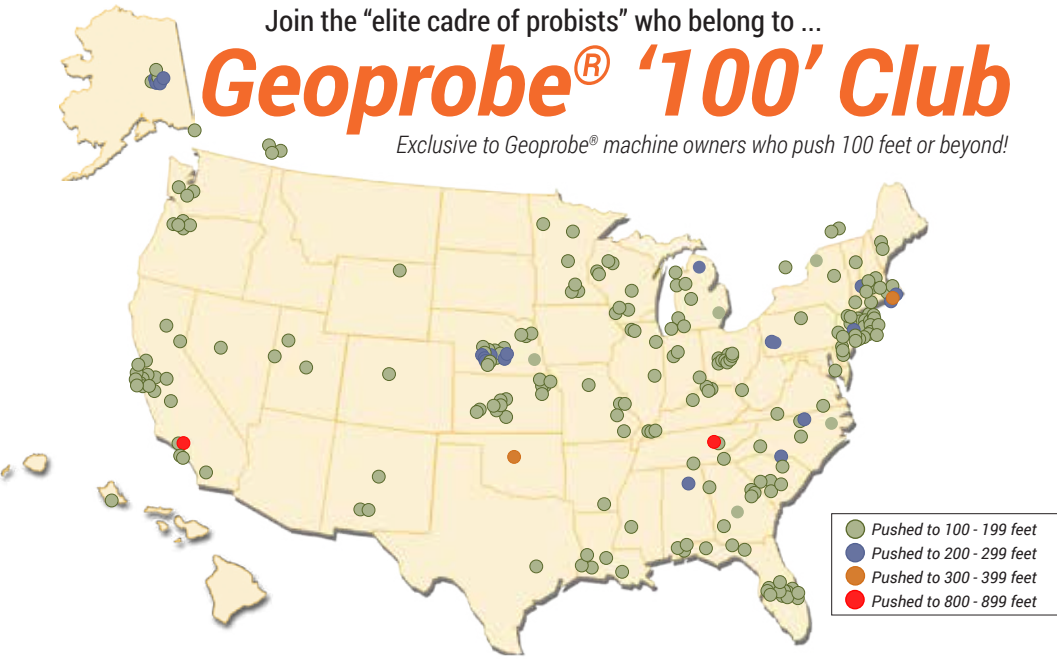


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## 155 feet

**Atlantic Testing Lab Ltd. – New York**

Depth/Date: 158 feet / Sept. 8, 2018  
 Geoprobe® Owner: Atlantic Testing Lab Ltd., Canton, New York  
 Field Data: Model 7822DT



## 103 feet

**Action Environmental - Florida**

Field Team: Jon Abbott, Otto Cutino, Alex Cuesta and Nick Chin (HSW)  
 Field Site: Indiantown, Florida  
 Depth/Date: 103 feet / May 4, 2018  
 Geoprobe® Owner: Action Environmental, Tampa, Florida  
 Field Data: Model 78230DT SP-16 GW sampling



## 106 feet

**Nebraska Department of Transportation – Nebraska**

Field Team: Alex Silvey, Doug Churchwell, Nikolas Glennie  
 Field Site: I 80, Greenwood, Nebraska  
 Depth/Date: 106-feet / May 16, 2018



## 150 feet

**Mannik Smith Group - Michigan**

Field Team: Mark, helper, Rob Schippert, driller  
 Depth/Date: 150 feet  
 Field Data: 4.25-inch hollow-stem augers to 20 feet, AWJ rod with a 4-inch tri cone to do mud rotary to rock 150 feet down sampling every 5 feet. Rock core barrel was 3.5 x 5 foot



## 190 feet

**GinnMineral – Georgia**

Field Team: Stephen and Hodges  
 Depth/Date: 190 feet  
 Field Data: 8150LS Rotary Sonic



## 105 feet

**SENSATEC – Germany**

Field Team: Mateusz Samborski and Markus Langhoff  
 Field Site: Industrial Park Schwarze Pumpe, Senftenberg, Germany  
 Depth/Date: 105 feet  
 Geoprobe® Owner: Sensatec GmbH  
 Field Data: 7822DT with MIP/1.5-inch rods



## 101 feet

**AARCO and TRC Engineers – New York**

Field Team: Daybi Pacheco, driller, and Julio Cabrera, helper - AARCO; James Robinson, engineer - TRC  
 Field Site: Rockville Centre, New York  
 Depth/Date: 101 feet / March 29, 2018  
 Field Data: Model 7822DT, 4.25-inch ID HSA with continuous split-spoon sampling/SPT from 5-foot bgs (top 5 feet hand cleared)



## 120 feet

**Carolina Drilling – North Carolina**

Field Team: David Freedland and Joshua Rosenberg  
 Field Site: Tarboro, North Carolina  
 Depth/Date: 120 feet / June 25, 2018  
 Geoprobe® Owner: Carolina Drilling, Wilmington, North Carolina  
 Field Data: 6625 CPT



## 140 feet

**Mannik Smith Group – Michigan**

Field Team: Rob Schippert, Alex Edwards, James Faitel  
 Field Site: Detroit near Ford field football stadium  
 Depth/Date: 140 feet / Aug. 24, 2018  
 Field Data: mud rotary, using mud pan and 4.5-inch AWJ rods with tri cone bit



## 210 feet

**Shepler Well Drilling – Michigan**

Field Team: Cole Shepler, Brian Shepler, Clint Bridson  
 Field Site: Johannesburg, Michigan  
 Depth/Date: 210 feet / July 18, 2018  
 Geoprobe® Owner: Shepler Well Drilling, Manton, Michigan



## 200 feet

**Brookhaven Labs - New York**

Field Team: Richard Lagattolla, Jim Milligan, Bob Metz, Darren Harris  
 Field Site: Brookhaven National Laboratory, Upton, New York  
 Depth/Date: 200 feet / June 14, 2018  
 Field Data: 3230DT and advanced SP16 groundwater sampler



## 247 feet

**Enviroprobe Integrated Solutions – Pennsylvania**

Field Team: Jim Fore  
 Field Site: Cannonsburg, Pennsylvania  
 Depth/Date: 247 feet / Aug. 4, 2017  
 Geoprobe® Owner: Enviroprobe Integrated Solutions, Nitro, West Virginia  
 Field Data: 7822DT 20 feet, 3.25 augering and 227 feet of NQ2 rock coring



## 210 feet

**GeoTek Alaska – Alaska**

Depth/Date: 210 feet  
 Field Data: 8150LS, -38 degrees Fahrenheit



## 109 feet

**Geo Lab Proving Services Inc. – Georgia**

Field Team: Josue Vega-Marin, Benjamin Wallace  
 Field Site: Fort Valley, Georgia  
 Depth/Date: 109 feet / Aug. 2018  
 Geoprobe® Owner: Geo Lab Drilling, Atlanta  
 Field Data: Model 7822DT, HSA boring, setting 1-inch PVC temporary wells



## 100 feet

**GeoTek Hawaii – Hawaii**

Field Team: Quinton Wilson and Gabe Gutierrez  
 Field Site: US Army Garrison Kwajalein Atoll in the Republic of the Marshall Islands  
 Depth/Date: 100.5 feet  
 Field Data: Drive and wash HWT



**ADAPTABLE**  
Wide variety of drive heads available

**ASTM STANDARD**  
Design meets ASTM Standard D1586

Split tube soil sampling system  
manufactured under U.S. Patent 9,551,188

“ The interlocking split spoons are the best thing coming out on the geotech market. I... just hated the old ones and said ‘no more’ and ordered 10. ”

– William Ellis, Operations Manager  
Alt & Witzig Engineering, Carmel, Indiana

“ Just put ours out into the field on our drill rig in New Zealand. Nothing but praise from our team so far. ”

– Kris Hines, Operator  
Pro-Drill, Auckland, New Zealand



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Customers asked, and Geoprobe® tooling engineers have delivered. The interlocking split spoon everyone has grown to love will soon be available in a 3-inch OD version. Engineered and built to be stronger and last longer means the patented Geoprobe® interlocking split spoon saves you money and field time. Customer reports confirm their durability, describing the spoon as still looking new after 2200 feet and not bending even after nearly a year of use.



**WATCH THE VIDEO:**  
[geoprobe.com/split-spoon](http://geoprobe.com/split-spoon)



- **Interlocking Spoon Assembly:**
- **Watch it self align, increasing strength.**

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