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Every day is a new day, and each day holds many opportunities for each of us. We really need to look at those opportunities and grasp their relevance; then act on them. If we hesitate, that means opportunities lost.



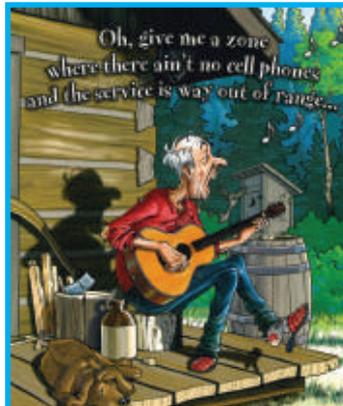
We had the pleasure of attending the 62nd AWWDA Convention in Red Deer, Canada, once again. These are very dear friends of ours for some 20 plus years. This year's convention had a sadness to it because the very special person, Carol Larson, who has been handling this association as Executive Secretary for 28 years was unable to be there due to health reasons. Even with uncertain times, the show did go on with Interim Executive Secretary, Sheena Larson, Carol and John's daughter, at the helm. She did a terrific job. Of course she should, she had practically grown up there with her parents, and always helped her mother with the convention details at registration, etc. Now, that is how it should be with each of our businesses - from mine to yours, and all those in between. It would be so great to have our children jump into our work and enjoy what it is we do. Some of course, have other plans, which may have felt into their thought process as ours fell into ours. That is still all good. The main thing is that we all be happy at what we do each and every day - for life is far too short.

With pen (computer) in hand . . .

Ronnie, Managing Publisher
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## Highlighting Damage Prevention with the Common Ground Alliance

by Bonnie Love, Editor, *WorldWide Drilling Resource*®

It was late March, when Jan and I loaded up in the *WWD*R Suburban and headed to Tampa, Florida, to attend the CGA (Common Ground Alliance) Excavation Safety Conference & Expo.

This event had a lot to offer the nearly 1700 attendees, including conference sessions, workshops, exhibits - both indoor and outdoor, as well as several networking events. The underground damage prevention industry was on display with over 100 exhibitors presenting the latest in equipment, software, and services.



Burnie, a natural gas flame, and Earl, an oil drop, were there to educate the public about safety, friendship, and having fun. Fans of the television show *American Chopper* were thrilled to see the 811 bike built by Orange County Choppers. Plus, the Missouri CGA group brought its micro sprint car and driver Nick Rasa to the show.



The educational sessions were incredible with over 80 hours of content available on subjects ranging from best practices for safer excavations; cybersecurity; lessons learned from Hurricane Michael; using 3-D mobile mapping for utility locating; leading practices for cross bores, and so much more! One session Jan and I really enjoyed was given by Cliff Meidl, a two-time Olympic athlete and survivor of an excavation construction accident. We'll have more of his story in a future issue of *WWD*R.



Safety and damage prevention deserve everyone's attention and CGA did a great job of highlighting its importance. Make plans now

to attend next year's show in Palm Springs, California.

To view all the photos from the event, visit [worldwidedrillingresource.com](http://worldwidedrillingresource.com)



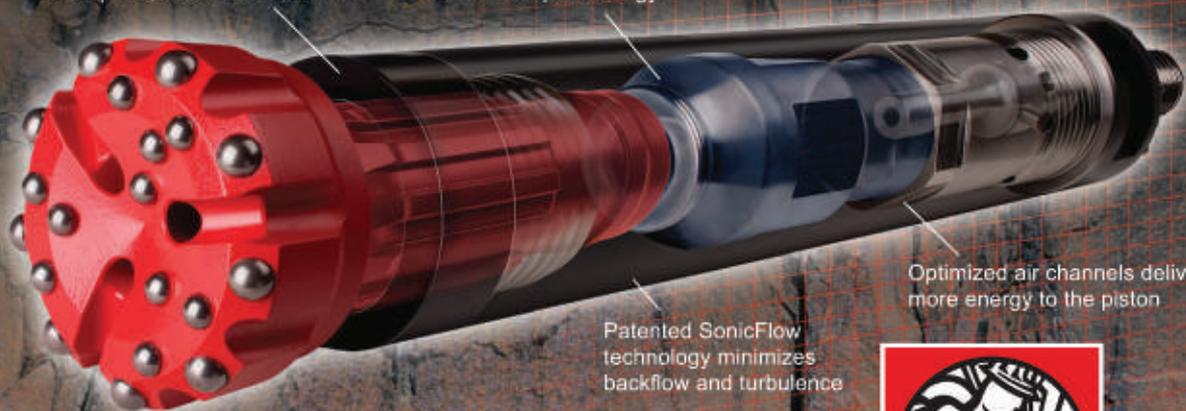
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**GEO The Pathway to Successful Widespread EGS Begins with Research**  
*Adapted from Information by the Geothermal Technologies Office*

The Geothermal Technologies Office (GTO) has introduced the Frontier Observatory for Research in Geothermal Energy (FORGE) Roadmap. This roadmap will outline research and development activities which will strengthen our understanding of enhanced geothermal systems (EGS) that could unlock 500 gigawatts of electricity in the United States.

FORGE is a unique field laboratory located in Milford, Utah, dedicated to researching EGS. The roadmap was developed by the Science and Technology Policy Institute (STPI) in conjunction with the geothermal industry. The institute focused on research recommendations for making EGS an affordable, sustainable, and reliable method of producing electricity. Development included detailed literature and program reviews, months of interviews, and a capstone roundtable with EGS research experts from academia, industry, national laboratories, and government.

FORGE's five-year operation will help tackle key challenges and help fill in the scientific knowledge gaps which are preventing EGS from widespread use throughout the country. The roadmap plots the way with actions categorized into three sections: Critical Research Areas; Enabling R&D (Research and Development); and Implementation Principles. Each of these areas represent a primary focus for FORGE and include tasks such as developing new well configurations and well field designs for optimal reservoir stimulation; new and revised fracturing technologies and procedures; as well as developing reservoir management processes and tools.

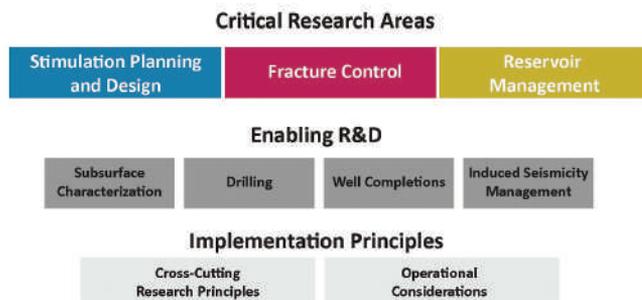
**The Critical Research Areas are:**

**Stimulation Planning and Design** - This is research for designing and stimulating wells according to the natural underground characteristics of the area.

**Fracture Control** - This area will focus on developing an optimal fracture network while increasing the understanding of resulting fracture systems.

**Reservoir Management** - Once a well is developed, sustaining the long-term heat exchange in the system must be researched. This area of research will help scientists predict and monitor changes in the reservoir.

FORGE's overall mission is to enable advanced research, drilling, and technology testing to improve current EGS technology. If FORGE can successfully execute the core research actions and research implementation principles, it can chart a pathway to success for developing EGS across the country and the world.





## Frequently-Used Geological Terms Part 82

Glossary Adapted from the Dictionary of Geological Terms

### R

**Rheid** - A substance (below its melting point) which deforms by viscous flow during the time of applied stress at an order of magnitude at least three times that of elastic deformation under similar conditions.

**Rheology** - Study of the deformation and flow of matter.

**Rhizoconcretion** - A small cylindrical or conical structure in a sedimentary rock, usually branching or forked, resembling a root of a tree. It may consist of material such as caliche or chert.

**Rhodochrosite** - A rose red or pink to gray rhombohedral mineral of the calcite group. It is isomorphous with calcite and siderite, and commonly contains some calcium and iron. It is a minor ore of manganese.

**Rhodolite** - A pink, rose, or violet garnet, intermediate in chemical composition between pyrope and almandine. It has a light color and a high degree of transparency, and is used primarily as a gemstone.

**Rhombic Dodecahedron** - A 12-sided crystal.

**Rhombohedron** - A crystal form in the hexagonal system bounded by six faces.

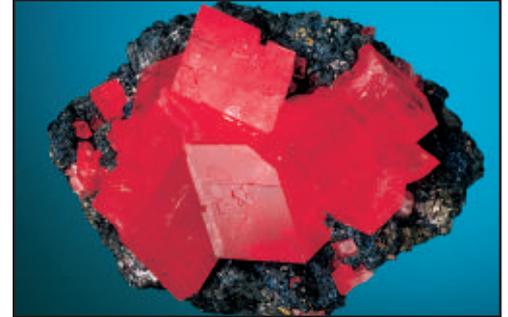
**Rhomb Spar** - Mineral dolomite in rhombohedral crystals.

**Rhyolite** - A group of extrusive igneous rocks, typically porphyritic and commonly exhibiting flow texture, with phenocrysts of quartz and alkali feldspar in a glassy, to cryptocrystalline groundmass. Also refers to any rock in that group; the extrusive equivalent of granite.

**Rib** - A layer or dike of rock forming a small ridge on a steep mountainside. Also used to describe an elongated pillar left in a mine for support. Could also be said of a radial or transverse fold on a fossil shell, such as a raised ridge on the coiled conch of an ammonoid or nautilus.

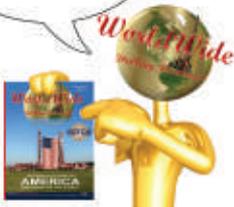
**Ribbon Injection** - A tongue-like igneous intrusion along the cleavage planes of a foliated rock.

**Ribbon Rock** - A rock characterized by a succession of thin layers of differing composition or color, such as a vein with narrow quartz bands separated by stripes of altered wall rock.



In 2002, rhodochrosite was declared Colorado's official state mineral.

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# The Un-Comfort Zone II

by Robert Evans Wilson, Jr.



## How My Best Friend Turned Me into a Dog Lover

Even though I've always had dogs, I'd never been much of a dog person, until Buddy. I was always a cat lover. Buddy wasn't even supposed to be my dog. When my ex-wife and I divorced, the dog we had a the time went with her. My sons would still see the dog on weekends when they were with their mother, and one day they came home and asked, "Daddy, may we please get a dog that likes us?" My heart went out to them, and I thought, "Every kid should have a dog that loves them." I agreed, but said we would have to adopt an adult dog. I explained that because of my busy travel schedule, I would not have time to train a puppy. They said they wanted a golden retriever or a border collie, so I set them up to look at dogs on several rescue shelter websites. They eventually found a rescue site with videos of dogs.

My sons had me look at a video of a border collie fetching a tennis ball and playing with other dogs. Unlike the boring still photographs of dogs most rescue sites offered, this video showed a dog which appeared to be both friendly and fun. Unfortunately, the rescue shelter was over an hour away and was only open when the boys were in school, so I had to go out there alone and make the decision of whether or not to adopt. It was the easiest decision I ever made. Buddy was everything the video promised and more. He was friendly, eager to please, and loved to play fetch. My sons needed a dog who would love them and play with them, so I adopted Buddy on the spot.

Every other dog in my life was always someone else's dog. My first dogs were my parents' dogs. The two dogs I owned while I was married chose and preferred my ex-wife. Buddy was supposed to be my sons' dog. They fed him, walked him, and played with him, but I was the one he chose. He became my shadow and followed me everywhere I went. In short, Buddy's love turned me into a dog lover.

Buddy's first symptom showed up on a Thursday morning when he threw up on the front porch. It looked like his entire breakfast, and the kibble didn't look much different than when I gave it to him. I didn't think much of it; I knew dogs occasionally threw up. It was a few hours later when I went out for our daily game of fetch that I noticed he had not gone back to it. That raised a red flag, but not a big one. Perhaps I was anthropomorphizing, but I wouldn't go back and eat my vomit, so didn't worry about it. I got the hose out and washed off the porch. The evening after he threw up, Buddy turned his nose up at more kibble, but ate plenty of treats. The next morning, he showed no interest in his regular food. He seemed okay other than that, so I decided to just keep an eye on him. That afternoon when it was time to play fetch, he seemed a little sluggish, so I decided not to run him, and just let him rest. He still hadn't eaten his food, so I offered him some treats. He ate very few of them. Now that was odd.

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Saturday morning, Buddy struggled to get out of bed, but once he was up, he seemed okay. He was still sluggish and had no appetite. My veterinarian was closed for the weekend, so I decided if he wasn't better by Monday, I'd take him in. Sunday morning he couldn't get out of bed by himself. My son picked him up and carried him downstairs for me. I put him in my car and took him to an emergency veterinarian. After a thorough exam, the doctor told me Buddy was dying of some type of anemia. He said the treatment would involve giving him a powerful drug that would shut down his immune system so they could give him blood transfusions without rejection. Then Buddy would need several weeks of chemotherapy. It was a costly treatment, and the doctor said there was a good chance it would not save Buddy. I thanked him, and decided to just take Buddy home and make him comfortable.

When I got Buddy home, I placed his bed with a training pad on it in the hallway between my office and the guest room so I could be with him 24/7 as we waited for the inevitable. I put a water bowl by his bed. An obedient dog, he drank every time I asked. I offered him easy-to-eat baby food and his favorite treats, but he still had no appetite. Three days passed. I talked with him frequently, petted him, and told him how much I loved him. He just lay there unable to move. On Thursday morning, I cooked bacon for breakfast and my son offered a piece to Buddy. He ate it! I couldn't believe it. I quickly cut up two slices of bread and soaked the pieces in the bacon grease. He ate all of it. A few minutes after eating, he tried to get up. I helped him stand for a moment, then laid him back down. I then went to the grocery store and bought several pounds of liver. I cooked the liver in bacon grease and Buddy ate every bite.

Remarkably, he started getting better. I fed him a pound of liver a day, and every day he improved. He would stand and walk with a wobble, and I would hold him up while he relieved himself. He continued to strengthen, and after several weeks he was completely back to normal. That was three years ago. It is now our ten-year anniversary. We still go out every day to play fetch, and at this moment my best friend is lying under my desk next to my feet as I write this article.

### *Robert*

Robert is an author, humorist, and innovation consultant. He works with companies that want to be more competitive and with people who want to think like innovators.

For more information on Robert, visit [www.RobWilsonSpeaker.com](http://www.RobWilsonSpeaker.com) or contact him via e-mail to [michele@worldwidedrillingresource.com](mailto:michele@worldwidedrillingresource.com)

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**EXB**

## Through the Back Door!

by **Jim Kuebelbeck**



Some time ago, I was invited to be the guest speaker at the Archaeus Project Research Group at the Bakken Museum in Minneapolis. The Bakken Museum was founded by the late Earl Bakken, the inventor of the world-famous heart pacemaker. His goal was to establish a research center for the continuing development of medical and other innovative concepts. Researchers from all over the world were regularly invited to speak and present the results of their ongoing discoveries. The topics were varied, and ranged from medical research, to puzzling discoveries in psychic abilities, to unusual phenomena and the “paranormal”. The Archaeus Project was formed in 1983 as a small discussion group which met monthly at the home of Earl Bakken. The group was soon joined by Dennis Stillings, a researcher in his own right, who had earlier built the collections of artifacts at the museum.

The Bakken Museum is now a renowned library of material focusing on the subject of “electricity in life”. Stillings went on to become the director of the Archaeus Research Project. In a relatively short time, under his direction, the size and activities of the group expanded. A speaker program was developed which involved inviting some eight or nine speakers a year to present on a very wide range of topics related to human potential. The main requirement for speakers was they be one of the best representatives of the particular topic on which they were invited to speak. The Archaeus Project took no official position on the subject matter; but required it be an open forum to discuss ideas and theories, however controversial. The purpose of the group was to discuss, and attempt to assess the claims arising out of the emerging “Human Potential” movement. The group included professionals with impressive backgrounds in science, technology, business, medicine, and the humanities. In addition to these activities, Stillings was given free reign to investigate the growing world of research.

Stillings had read newspaper articles about my successful locating of underground water sources (by the dowsing method) in areas where all previous attempts had failed, and invited me to speak to researchers at the Bakken Museum

about my work and my theories about the little understood practice of dowsing, and water dowsing in particular.

On the evening of my talk, I spoke at length about my work and the resistance I often encountered from geologists and hydrogeologists who refused to accept the possibility that any human could somehow sense the presence of underground water sources. I concluded my talk by asking: “Why is it, that those who know the least seem to have all the answers, while those who know the most have only questions?”

Many of the researchers in the audience came up to me after my talk and stated they also had often encountered great resistance in their early research by daring to challenge long-held views about “established science”. Albert Einstein was once

quoted as saying, “Great spirits have always encountered violent opposition from mediocre minds.” I don’t consider myself a great spirit by any stretch of the imagination, but I no longer pay much attention to those who attempt to deny the value of water dowsing as a legitimate method of locating satisfactory groundwater sources.

*The statements and comments in this article are based on information and references believed to be true and factual. If you have any questions or comments, please forward them to me in care of **WWR**.*

**Jim**

**Jim Kuebelbeck may be contacted via e-mail to [michele@worldwidedrillingresource.com](mailto:michele@worldwidedrillingresource.com)**

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# Tales from the Field

by Jeremy C. Wire  
Geoconsultants, Inc.



## The Dog Pound

A long time ago, we were working for a city client on a field project which involved making an inventory of active and abandoned water wells in the vicinity of a cogeneration plant. At the time, the plant was inactive and not in operation. The facility had a fence around it, and its main purpose, or so we thought, was to keep trespassers out, as there were no security guards. However, we found out the fence also provided an enclosure for another unrelated purpose.

One day, two of us were involved in doing our reconnaissance trying to locate some wells, and one of the sites for an abandoned well was supposedly outside the fence on the east side of the plant property. This area is where we started our search. Moving through some tall weeds obscuring our view through the fence, and not finding any trace of an abandoned well, we slowly moved toward the front of the property. Peering over the fence from a distance, we saw some vague forms scattered about in one area of the enclosure. At first glance, they looked like some small animals lying about and sleeping in the sunshine. A closer look suggested they might be dogs . . . but why were they here? We looked at each other, and the adage about "letting sleeping dogs lie" seemed to go through both our minds.

We decided there was only one way to find out, so we moved quietly and slowly to the front steel gate, then rattled it vigorously. Upon doing this and breaking the silence, there was a huge commotion, and dogs were everywhere! There must have been at least 20 or more, all barking and in a frenzy. We found out the city used this old plant as a temporary dog pound, at a time when the usual animal shelter was unavailable. We wondered how you would ever care and feed all these dogs all at once.

About a week later when we were in the field again, we stopped by to check the plant and visit the dogs. However, we never found out the answer to this question as there was nothing but silence in the enclosure, and the dogs were gone.

*Jeremy*

Jeremy Wire may be contacted via e-mail to [michele@worldwidedrillingresource.com](mailto:michele@worldwidedrillingresource.com)

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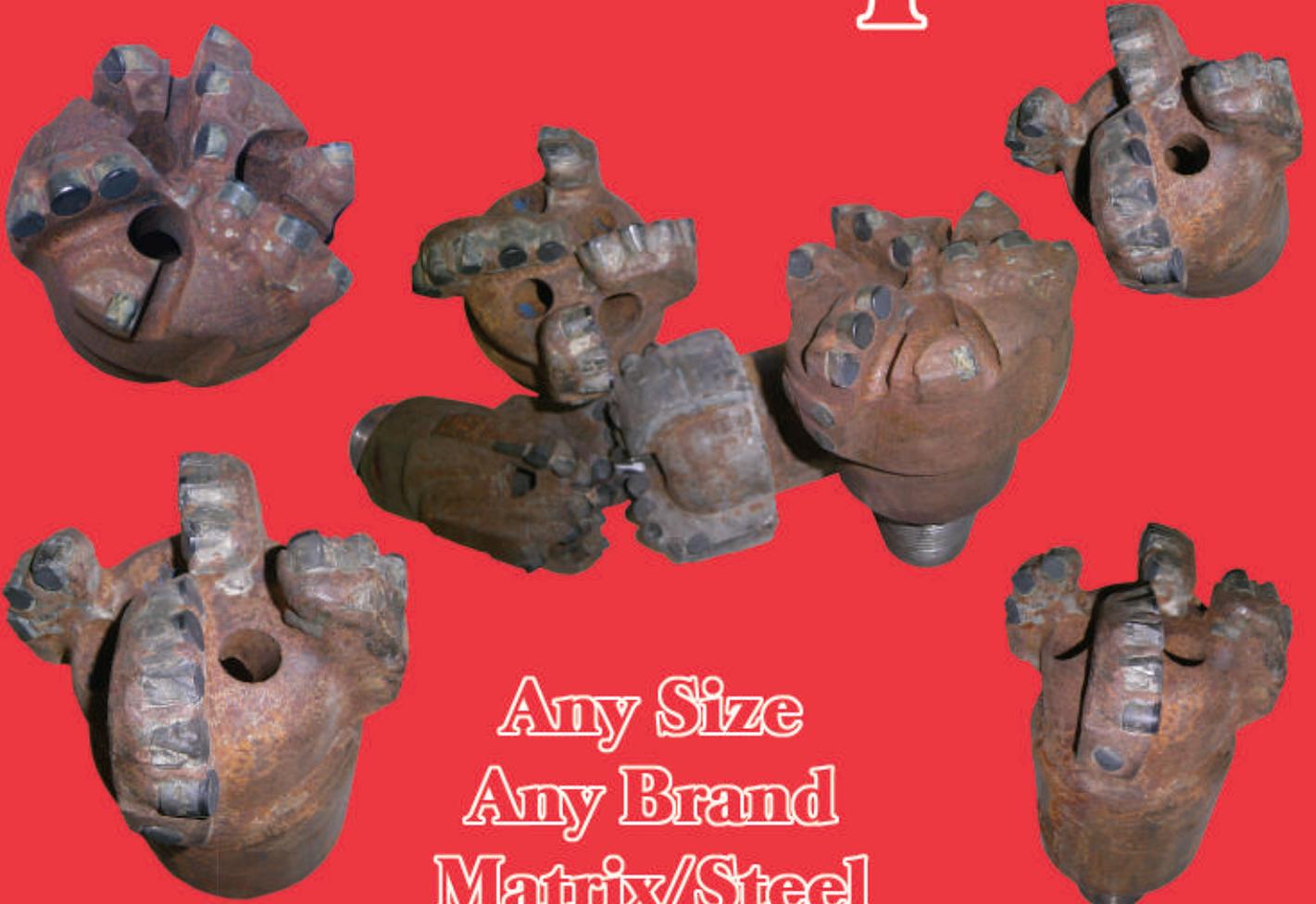
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by Tim Rasmussen

A letter from Gary in Guatemala: "Coming up slowly" is a phrase Berny often uses when working to get our shipment out of customs at the port, and that's how our first few days have gone. We arrived at ICAP [campus where Water For Life is located] in the evening. The remainder of the week we cleaned apartments, sorted through the items that came in our earlier container, and took all the medical equipment and supplies to the health ministry and government hospital in Poptun.

This week, we tucked more things away from the shipment and began getting the trucks ready for the drill crew; aired the tires and replaced some batteries, broken mirrors, windshield wipers, etc. Bucky's rig was on blocks in the shop where we need the space. I asked Edgar to get the brakes done, and he's making progress on it. The rig is out of the shop now, but waiting for Bucky to bring a part.

When I was here a few months ago, the pump truck brakes were not so good and I asked Edgar to check them. We changed a hand pump that wasn't working in Secoyob this week, and the brakes still weren't good. We've had brake problems on the truck every year, and we've had different shops work on them. I asked Huberto, a man we're going to try to train to operate a well drill, to work on the brakes. He's very thorough and experienced, and found the right rear drum was extremely worn to the point of having a hole in it. I've never in my life seen that. We're trying to find parts now. Who knows, we may find other problems too.

The Mayhew 1000 rotary came out of customs and made it to ICAP in the wee hours of the morning. Headlights didn't work so the fellows tied a light on the grill and came to the shop with that. When they left the port, they filled two diesel tanks, not realizing there were three tanks. When the truck quit, they used their water bottles to transfer 100 gallons of fuel to the proper tank. Seth will come Tuesday and begin drilling in the El Chal and Poptun districts Wednesday.

Last week, Steve Willis and his family finished doing well surveys at sites where we plan to drill this season. They are missionaries here and live in the Antigua area. We truly appreciate their professional assistance. We'll see how the season goes, as some drill helpers are not able to come this year. Health issues, weddings, etc. will keep some away.

Today, the six of us will empty the north container and begin building shelves. We have many things to put away yet, and are in desperate need of more organization.

Friday, a couple of workers laid out the footprint of the kitchen by our apartments, and began digging footers. It will be a welcome addition, saving much time getting things out of storage and putting them back each year.

We appreciate your prayers.  
Until later, Gary

If you would like to help, contact Gary Bartholomew at 509-466-5075 or 509-939-1941

Tim

Tim Rasmussen may be contacted via e-mail to michele@worldwidedrillingresource.com



Temporary headlight attached so they could drive the rotary drill from the port.

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## Airplanes Don't Just Drop Out of the Sky

by **Britt Storkson**  
Owner, P2FlowLLC

In my April 2019 *WDR* article, I commented on the Lion Air plane crash in Indonesia, and the need for the proper number of sensors to make sure everything works correctly regarding the computer controls.

A short 5½ months after the Lion Air crash, another Boeing 737 MAX 8 crashed in Ethiopia, in a very similar manner. Both planes violently lurched nose-downward and crashed a few minutes after takeoff.

While I am not a part of the team investigating these crashes and do not have all of the facts regarding what happened to cause them to crash, I would like to offer some informed comments based on what I do know - and that is computer systems and the way they are developed, which I believe to be the problem here.

I understand the aircraft in question had received new engines which altered the way they responded to cockpit computer commands. It appears either the full scope of the change was not taken into account and/or it was inadequately addressed and tested before being released for sale.

There are certain hard and fast realities which must be respected when developing computer system software and hardware.

**First:** The computer hardware and software must be tested UNDER ALL CONDITIONS it will encounter during its lifetime. This includes ambient temperature, pressure, humidity, G-forces, possible radiation exposure, and any other extremes known to exist. One way to test products is to give them away for noncritical applications and periodically ask the users how the product has performed. Often, these control units end up outside (not recommended) or otherwise abused and that's fine. If it does fail, we want it to fail in such a way it will not cause more problems. The only way to determine if the product is truly "bulletproof" is to simply live with it. There is no other way.

**Second:** One cannot simply just "add" software to an existing program. Things don't work that way. Any changes must be carefully integrated into the existing program because one change could impact something entirely unrelated somewhere else in the program. Any and all conflicts must be resolved and be thoroughly tested before releasing the product for sale to the public.

This is only speculation, but I suspect new engines were installed which significantly altered the flight dynamics and it was not fully addressed by the auto-pilot software and were not adequately tested before releasing for sale. With almost any machine, when one changes one part of the machine, often other parts must be changed as well. They must be carefully vetted changes, being fully tested both independently, as well as tested in the final product - not just something installed as a "patch".

I would submit the major factors leading up to both recent 737 MAX 8 airplane crashes were:

- Overly complex autopilot software making adequate testing virtually impossible, as well as far more costly and time consuming.
- The computer controls developers are too far removed from what actually happens "in real time". Very few developers know what really happens between the command they type into the computer and what "comes out the other end". While this may work in the short-term, it's a long-term recipe for disaster.
- Production deadlines and budget limits were unrealistic given the scope of what was needed to ensure proper testing.

• The overall philosophy of the autopilot "flying the plane", which fosters pilot complacency and inattention to detail. The pilots should fly the plane with the autopilot as a backup - not the other way around.

Despite the validity of my comments above, do you think the industry will listen?

*Britt*

Britt Storkson may be contacted via e-mail to [michele@worldwidedrillingresource.com](mailto:michele@worldwidedrillingresource.com)

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## Drilling Resumes on Thunder Bay Silver-Cobalt Project

EXB

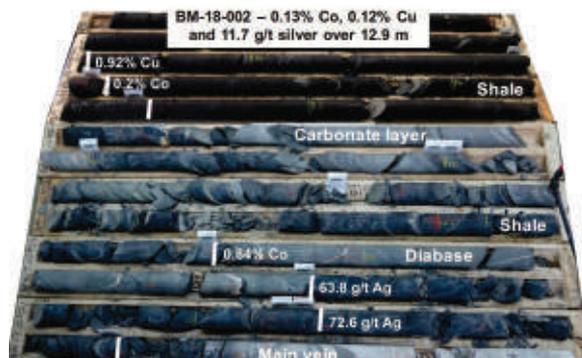
Adapted from Information by Honey Badger Exploration Inc.

Honey Badger Exploration Inc. is starting a drilling program of over 6500 feet on the Thunder Bay Silver-Cobalt Project, located west of Thunder Bay, Ontario, Canada. The objective of this year's drilling program is to follow-up on the successful 2018 program, and evaluate select targets along an east-west trending regional structure interpreted to control silver and cobalt mineralization.

The main target will be silver mineralization in the down-dip extension of a vein in the Beaver Mine. In 2018, the drilling program intersected significant high-grade silver mineralization in this vein.

The company will also target another area which covers the interpreted geological extensions of the silver and cobalt intersections obtained during the 2018 drilling program. They will target near-surface cobalt mineralization close to the Beaver Mine in a large diabase sill at its contact with the underlying Rove Shale.

Quentin Yarie, president and CEO of Honey Badger stated, "We are looking forward to this next phase of drilling that will build on the significant successes of our 2018 drilling program and test the exploration potential of priority targets in new areas. We discovered high-grade silver mineralization below the historic Beaver Mine in two different structures, broad zones of cobalt mineralization near the Beaver Mine, and a chemical zonation in the shales that suggests a large hydrothermal system. We would also like to acknowledge and thank our shareholders for their patience and support during the extended waiting period it took to permit exploration on the property. With all the permits now in place for a period of three years, Honey Badger can move forward to explore and develop the promising Thunder Bay silver and cobalt district."



Cores from the 2018 drilling program.

*Editor's Note: In between our print issues, the **WDR** Team prepares an electronic newsletter called **E-News Flash**. Based on readership, this was the most popular **E-News Flash** article of the month. Get in on the action and subscribe today at: [www.worldwidedrillingresource.com](http://www.worldwidedrillingresource.com)*

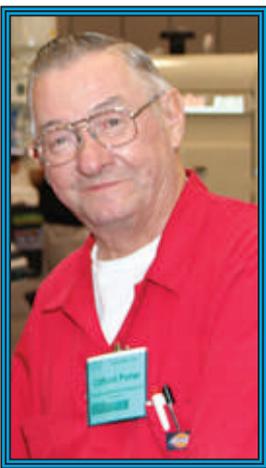
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# Rest in Peace Dear Friend . . . Clifford W. "Cliff" Porter

5/10/1939 - 4/3/2019

by Veronica I. "Ronnie" Jones  
Managing Publisher

*WorldWide Drilling Resource®*

A friend's passing is never an easy thing to talk about. Cliff was a dear friend to our family here at *WorldWide* and he deserves talking about.

Shocked by hearing the tragic news, and realizing we wouldn't be seeing him at events anymore, was overwhelming. He was so dedicated to this drilling industry, as are his daughters Michelle and Roberta, and Chris, his grandson. Cliff's smile, knowledge, and friendly manner with potential, as well as current, customers will be greatly missed within our industry.

Cliff was born to John Calvin and Mildred (Cabeth) Porter in rural Armstrong, Iowa. He attended public school there and married Sharon Roberta Corderman, who predeceased him in early 1999.

He remarried Kathleen Fae (Riley) Heyn in late 2000. Already having a large family, his family grew even larger.

Cliff enjoyed his friends and family; teasing his great grandchildren; taking his "dog friend" Zoey for rides in his Smart car; people watching and striking up conversations - just because that was Cliff; and traveling for business and pleasure the world over.

As was his unselfish way, Cliff requested his body be donated to the Research For Life Organization. His celebration of life took place April 27th at Pocahontas Expo Center, Iowa.

Our sincerest sympathies go out to his family and friends.



Lest we forget . . .



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# In Memoriam

## Howard L. Goss II (1957~2019)



The **WWD** Team was saddened to learn of the passing of Howard L. Goss II on April 27, 2019. A resident of Charlestown, New Hampshire, he was 61.

He was born in Bellows Falls, Vermont, and later graduated from Fall Mountain Regional High School. He married Julie Ann Cannon in August 1978.

Howard was well-known throughout the New England area water well industry, having spent the last 35 years at businesses such as Gill Rock Drill Company, Inc., H & H Drilling Supply, Groundwater Supply Co., Inc., Foothills Drilling Equipment, Inc., and The Blake Group. The **WWD** camera caught Howard at several events over the years.

Spending time with family, having cookouts, and watching his grandkids' games were his favorite past-times. He also loved to shop and spoil everyone.

Howard is survived by his wife Julie; sons Howard III and Adam (Ashley); grandchildren Natalie, Mathew, Grace, Maria, and Charles; sister Joni Jo; sister-in-law Judy; brothers-in-law William, Henry (Barb), Grodon (Deb), and David; niece Tawnia; and nephew Tobin.

## Olga Marie Hamernik (1925~2019)

Olga Marie Hamernik, of Leigh, Nebraska, passed away on March 3, 2019, at the age of 94. Born to Frank and Bessie Bilek in 1925, she was an only child. After graduating high school in 1942, she took an extended course with Lincoln School of Commerce, then married Joe in 1951.

They farmed near the town of Leigh, where Joe started a plumbing and well business. They stopped farming in 1960, to devote all their time to the business. They incorporated Hamernik Plumbing and Well Drilling in 1979, and were joined by their two sons David and Lyle. Olga was the bookkeeper for the company for 50 years, and still semi-active at the time of her death.

Proud of her Czech heritage, Olga loved to listen to sing-alongs and dance to polkas and waltzes. She enjoyed cooking, baking, gardening, canning, flowers, taking care of her lawn, travelling, playing cards, watching the Nebraska Cornhuskers play football, crocheting, reading, and solving variety puzzles. She was a loving person with a great sense of humor.

Olga was preceded in death by Joe and Lyle. She leaves behind her son David and daughter-in-law Arlene; grandchildren Harley, Becky (Sean), and Kelli (Brent); and great-grandchildren Taylor, Jordi, Joey, Jett, Judd, and Kasen.



## Richard L. "Dick" Washburn (1936~2019)



Richard L. "Dick" Washburn, 82, of Dundee, New York, passed away unexpectedly on March 30, 2019. Born in Wayland, New York, in 1936, Dick's family moved to the Dundee area in 1940. In 1957, he married Ruth, who passed away in 1994.

He was owner and founder of Richard L. Washburn Well Drilling, and a member of the Empire State Water Well Drillers Association and the Barrington Rifle Club. His passions were classic cars, auctions, old tractors, and coffee breaks. He loved helping others, hauling water, mowing grass at the Club, and especially spending time with family.

Dick is survived by his children Stephen (Joan) and Karen (Shawn); grandchildren Stephanie (Chad), Patrick (Rose), Courtney (James), Hannah (Ryan), and Preston (Hannah); great-grandchildren Elle, Weston, Charleson, Tayden, Evelyn, and Tysen; his dear companion of 24 years, Linda; brother Robert and sisters Doris and Norma; numerous nieces, nephews, countless friends, and his four-legged fur buddy, Ripkin.

The management and staff of **WWD** extend their sincere condolences to the family, friends, and colleagues of these industry veterans.

Lest we forget...

### Product Spotlight

Flomatic® announced the release of their new constant flow control valve, Flo-Trol® Model CD900, with a stainless steel body. Designed to give constant flow over a wide range of pressures, it has no moving parts - rather a self-cleaning, flexible orifice which varies in size with applied pressure so a constant flow rate is maintained. It is available in five sizes from 3/8-inch to 1-inch, and in 58 flow ranges.



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## Drilling Into Money Not Boring

by Mark E. Battersby

### Smaller Bottom-Lines for Those Who Lease

Whether equipment, other business assets, or even the property housing the drilling operation, lease and rental payments are frequently one of a business's largest recurring expenses. Soon, however, those leases must be listed as liabilities on the balance sheet - suddenly visible to potential investors, lenders, and suppliers.

This is quite a change from the existing treatment where many leases would have been considered as operating leases and rentals simply deducted as operating expenses on the financial statements. Although publicly traded companies were required to begin treating leases as liabilities as of December 15, 2018, privately held drilling operations and businesses have until 2020 to comply - plenty of time to renegotiate lease terms and plan to reap the potential benefits.

The culmination of years of debate, the new lease standard (ASC 842, Leases), requires businesses to move the future costs of their operating leases from the footnotes, where they are now reported, to the category of "liabilities" on the balance sheet. A corresponding "right to use" asset gets reported on the asset side.

While the new leasing standard will require new accounting procedures and reporting, the benefits of leasing remain - and are perhaps improved. Combined with changes in the tax laws, lease financing with its wide range of inherent advantages, will continue to be a beneficial option of equipment acquisitions.

Passed at the end of 2017, the Tax Cuts and Jobs Act (TCJA) included a number of provisions impacting equipment acquisitions and financing. Under the TCJA, for example, current deductibility of interest expense is limited to 30% of earnings, with small businesses exempt from this deduction ceiling.

Leasing allows a drilling operation without the ability to use 100% bonus depreciation to reap the benefits via a reduced lease rate since the lessor can claim it and other write-offs. Lessees may also enter into sale-leaseback for an asset already fully expensed, since the gain taxed on the sale would be taxed at the new favorable 21% tax rate for corporations.

Bottom-line, the new rules have no impact on a drilling operation's income statement and, thus, there should be no effect on debt covenants. Of course, adopting the new standard, complying with the new definitions for lease transactions, and ensuring a minimal impact on the drilling business's dealings with potential lenders, investors, and suppliers means starting now. And, as always, professional assistance is highly recommended.

*Mark*

Mark E. Battersby may be contacted via e-mail to [michele@worldwidedrillingresource.com](mailto:michele@worldwidedrillingresource.com)

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## The "Idiots" Corner by "Billy Bob Smith"

You think we are not headed for the following? Trust me, it's only a matter of time.

- Alexa,  
 . . . tell my husband to take out the trash. . . . tell my wife she needs to stop nagging me.  
 . . . tell the dog to stop barking. . . . tell my boss - I quit.  
 . . . tell the neighbors I am tired of their loud music.  
 . . . tell the children to clean up their rooms and dinner is ready.  
 . . . tell my boyfriend he needs to lose 20 pounds. . . . tell my ex-wife to stop texting me.

Need I go on?

I thought the above was a creative and kinda new idea, then I searched "Alexa Commands & Questions" and got lists of over 5000 common ones. Can you believe it???? You have to be kidding me, dude. Here are just a few:

- Alexa, why are you so serious?  
 Alexa, do you feel lucky, punk?  
 Alexa, are you mad at me?  
 Alexa, I'm sad. What should I do?  
 Alexa, is it okay if I have another beer?  
 Alexa, what came first - the chicken or the egg?  
 Alexa, who should I bet on at the races next week?

And it gets even worse . . . just a few common commands people use today:

- Alexa, is it going to rain today? Alexa, check my bank balance.  
 Alexa, I'm tired. What should I do?

I'm sorry, I can't do this any more. What's next?! Alexa doing auctions, marrying couples, teaching children, arresting criminals, and how about serving in congress - oh, I'm sorry that's already happening.

*Billy Bob*

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# Record-Breaking Attendance at bauma 2019

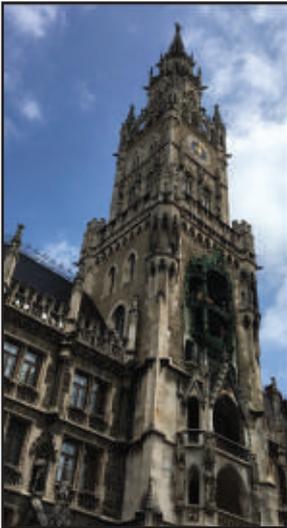
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by Ed Moranski, Chief Marketing Officer  
*WorldWide Drilling Resource®*

This year's bauma Germany took place the week of April 8th, 2019, and it was the largest in the expo's 65-year history. It was billed as the largest equipment trade event in the world, and after attending, I can see why. I think 95, if not 100% of the people on the flight from Atlanta, to Munich, Germany, were bauma attendees. Even at passport control at Munich International Airport, the official said, "Yes, I know, bauma" for the reason of my visit.

Marcel and I arrived a day ahead of time so we had the opportunity to visit downtown Munich for some traditional German food and sightseeing. So much history and outstanding architecture in the buildings. After a bite to eat, we set out to explore the city. One stop was to Saint Peter's Church which is the oldest church in the district. After a fire in which the building was destroyed, it was reconstructed and dedicated in 1327.

Transportation to the expo included train, bus, taxi, bike, or on foot - just follow the crowd because all roads lead to bauma. This year's expo had a record number of visitors with more than 620,000 attendees from over 200 countries. The equipment towered over the area. As you got closer to the expo, you could feel the excitement in the air. This year's bauma had about 3700 exhibitors from 63 countries. I'm glad I did my prep work on who and what exhibitors I wanted to see. I recommend this for anyone going to the show.



break in the clouds and headed outdoors to view and visit with those exhibitors.

With so many invitations to press events, we had to plan our time accordingly. It would be impossible to attend them all. Monday, the first day of the expo, Marcel and I walked just over seven miles. Oh, did I mention, comfortable shoes are a must!

With many of the booths offering food and beverages, we knew we had to pace ourselves or we would be in need of an afternoon nap. When we did need some downtime, we knew who had the best espresso on the expo floor and managed to stop in for some good conversation and a needed beverage.



Our first stop was to get our press passes and wait for the opening of the gates. There were so many people, I was glad we were not in that crowd and had the advantage of overlooking the sea of people from the press area one floor up (see above).



Although the weather forecast had predicted rain all week, when the skies were clear, we took advantage of the





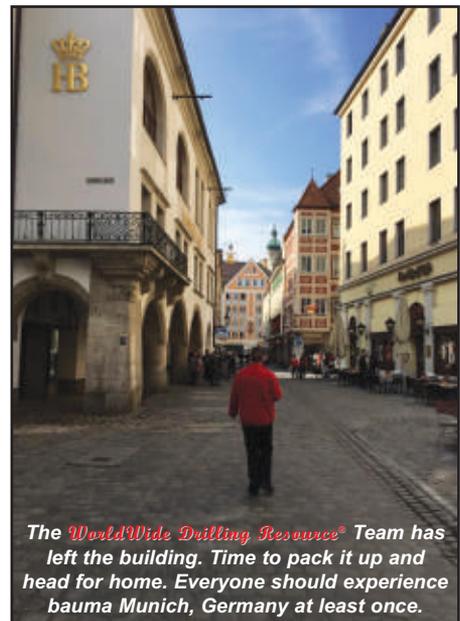
*WWD R photos.*

We were surrounded by new technology, improvements to existing equipment, and more accessories than you can think of on any given day. All the manufacturers were looking to impress show attendees. Many exhibitors had clever and eye-catching displays to attract your attention. Massive displays and hospitality buildings were set up inside and out. Crowds and crowds of attendees gathered at the outdoor demonstrations to see equipment in action.

Even with the crowds, the excitement of new equipment, and all of the incredible displays, it was great to be noticed as the **WWD R Team** with our world-famous **red jackets**. I do mean world-famous as both Marcel and I were welcomed warmly by many of our friends and customers from around the world; we truly are an international publication and company.

If you have never attended or exhibited at this event, I would highly recommend you add it to your list of things to do. Come with a plan, some good walking shoes, an appetite, and a thirst for knowledge. You will not be disappointed.

Make sure to look for the **WWD R red jacket Team** at the next bauma Germany event, April 4-10, 2022.

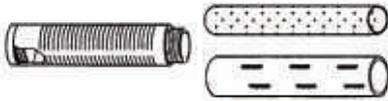


*The WorldWide Drilling Resource® Team has left the building. Time to pack it up and head for home. Everyone should experience bauma Munich, Germany at least once.*

To view all of the photos from bauma Munich 2019, [click here](#) or visit our website [worldwidedrillingresource.com](http://worldwidedrillingresource.com)



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## Project Resumes to Reduce Flooding in England

ENV

Adapted from Information by Environment Agency, UK

Essential work on a flood alleviation project resumed in Earby, England, to reduce the risk of flooding to 91 homes and 17 businesses. The flood alleviation project involves making Victoria culvert structurally sound. Culverts are important structures which carry water underground. Culverts in the area were often built to allow development to take place around them, such as roads, homes, and businesses, so many people live and work near culverts without knowing they are there.

The culvert repair project started in Lancashire in July 2018, and was expected to take 13 weeks to complete, but the project experienced a setback due to a major obstruction being discovered while drilling the new culvert beneath a disused railway embankment.

The Environment Agency's contractors, JBA Bentley found a solution to complete the remaining part of the culvert repair project. Further investigation of the existing culvert concluded a technique called pipe bursting can be used to remove the obstruction and install the new culvert along the existing line.

Other parts of the project have progressed and have been completed, including almost 200 feet of structural relining of the culvert. The Environment Agency continues to explore other options to reduce flood risk from all sources in and around Earby, including possible flood storage areas and installing a flood defense wall.

Paul Swales, flood risk advisor for the Environment Agency said, "We are now closing in on the completion of this project and would like to thank residents and businesses for their patience and understanding while we carry out this essential work to reduce flood risk in Earby."



## The World of Minerals

Yes! Horizontal directional drilling is used to locate minerals.

an organism); solid; have a limited range of chemical compositions; and an ordered atomic structure.

If the properties of water are compared to the five requirements of the mineral definition, it fails to qualify as a mineral because water is a liquid, which does not meet the requirement of a mineral being a solid. However, at temperatures below 32°F (0°C) water becomes the solid material called ice, which is a naturally occurring compound with a defined chemical formula and crystal structure, thus making it a legitimate mineral. Its only limitation, in comparison to all other minerals, is that it is

not stable at room temperature. Furthermore, an ice cube made in a refrigerator would not be considered a mineral because it was produced by the actions of people. So, ice is a mineral only when it forms naturally.

**Ilmenite** is one of the most significant ores of the metal titanium, and is named after the locality of the Ilmen Mountains, which are a part of the Southern Urals of Russia. It is an important industrial mineral mined in several deposits throughout the

Ilmenite is very similar in structure to hematite, and is essentially the same, but with roughly half the iron replaced with titanium. Small amounts of titanium combined with certain metals will produce durable, high-strength, lightweight alloys. These alloys are used to manufacture a wide variety high-performance parts and tools, including aircraft parts, artificial joints for humans, and sporting equipment such as bicycle frames. About 5% of ilmenite is used to produce titanium metal.

Most of the remaining ilmenite is used to make titanium dioxide - an inert, white, highly reflective material. The most important use of titanium dioxide is as a whitening, which is a material ground to a powder and used as pigments. These pigments produce a white color and brightness in paint, paper, adhesives, plastics, toothpaste, and even food. Titanium dioxide is also used to make powders with a tightly controlled particle size range. These powders are used as inexpensive polishing abrasives in a variety of lapidary work which includes rock tumbling, lapping, cabbing, sphere making, and faceting.

**Ice is a mineral?** Although many people do not think about ice as a mineral, it is a mineral just as much as quartz. To be a mineral, a substance must meet five requirements: naturally occurring (not made by humans); inorganic (not produced by



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There is a sponsored breakfast on Sunday, then the trade show is back open from 9 a.m. until 2:00 p.m.

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See more events at [www.worldwidedrillingresource.com](http://www.worldwidedrillingresource.com) online issue.

## What Better Way To See Underground?

*Adapted from Information by British Geological Survey*

GEO

The UK's top geoscientists have completed drilling of their first 650-foot-deep borehole at the UK Geoenergy Observatory in Glasgow. The observatory will allow the earth science community to see whether warm water within the UK's disused mine workings can generate a geothermal heat source capable of becoming a sustainable part of the energy mix. The drilling team will create 12 boreholes at depths from 30-650 feet.



The same scientists want to create a sister site in Cheshire to achieve an even bigger science ambition. The British Geological Survey (BGS) has submitted a planning application to Cheshire West and Chester Council (CWACC) for a UK Geoenergy Observatory at Ince Marshes in Cheshire, which would make Cheshire home to the best-characterized rock mass in the world, providing a world-class environmental baseline on how the whole underground system works. It would enable research around a range of geoscience questions relating to techniques such as storing carbon, utilizing rocks as a battery store for solar, wind and tidal energy, geothermal energy, and shale gas.

The BGS would like to drill 50 boreholes at depths from 160-3930 feet. They would contain a network of 1800 seismic sensors and 3 miles of fiber-optic cable transmitting data on earth tremors 1000 times more sensitive than people can feel. Thousands of water samples could be taken over the next 15 years from 160-1310 feet below the surface. Additionally, 5 miles of borehole drilling would generate 9840 feet of rock core to be taken back for laboratory analysis.

All data would be available through a publicly owned website, and the observatories will facilitate STEM (science, technology, engineering, and mathematics) education and engagement programs.

Professor Mike Stephenson, chief scientist at the BGS said, "More and more of the solutions to decarbonizing our energy supply will need to come from beneath our feet. Ensuring we take forward these solutions in a sustainable way means understanding more about the system. The UK Geoenergy Observatory in Cheshire will build up that high-resolution picture, providing a breakthrough in our understanding. This would be a world first in being able to observe the underground environment so closely and consistently. What we learn in Cheshire will lead the way in understanding the geological environment."

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# Whale of a Find

Adapted from Information by Engineers Australia

A drilling crew working on a project in Quindalup, Australia, made an unexpected find when they encountered a giant whale bone which could be thousands of years old. The bone was discovered buried at a depth of over 13 feet during the drilling of a manhole as part of Water Corporation's Infill Sewerage Program, which allows residents to connect to the central wastewater system, reducing the risks to the environment related to the use of old septic tanks. As soon as the crew realized what they had unearthed, work was stopped and experts from the Western Australian (WA) Museum were contacted for advice.

"It's not every day you make such an interesting discovery when working on one of our projects, and everyone was pretty excited to find something so unexpected," said Water Corporation Assets Delivery General Manager Nathan Hardwick. "We have now handed over the whale bone to the WA Museum to clean and restore, so it can be accessioned into its collection."



WA Museum Earth and Planetary Sciences Head of Department Mikael Siverson said, "The soft sand in which the bone was found, its comparatively lightweight, and lack of cemented shell fragments indicate the rib originates from the Holocene period, which is the current geological age, and began about 11,600 years ago. At the end of the last cold glacial period, often called the Ice Age, the global sea level rose rapidly reaching its current level roughly 8000 years ago. This date gives us a probable maximum age for the bone."

As part of the WA Museum's quarantine protocol, the bone will stay in a freezer for about three weeks before it is cleaned and examined. The museum will study the bone to see if it has any marks, including possible bite marks from sharks. Following examination, the bone will be assigned a WA Museum number and become part of the Vertebrate Fossils collection. The museum only had a few sub-fossil whale bone specimens before the addition of this partial rib bone.

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## Another Day Closer

by Tim Connor

Every day you are another day closer to - what? Well, think about it - closer to your last day. I'm not being morbid here, but I'm asking you to consider - do you know how much time you have left? Of course you don't, no one does! And yet, it's amazing how many people act if as they have forever - squandering days, weeks, and even years with no purpose, passion, joy, or a sense of adventure and gratitude for the time they are given.

Retire if you will. Quit if you must. Give up if you are tired of fighting. Surrender if you feel like life is over. Had enough? Okay, settle if you feel you don't deserve better. Stop trying if you are tired of losing. Cave into others if you are over being criticized, invalidated, or belittled. Trust me, I can go on with this babble if you want, but personally, it's hard to even write this stuff sometimes.

Why do we wait, postpone, give up, stop trying, or just feel like enough is enough and it's time to let "whatever will be will be" rule our final or closing years, however many we feel we might have? Is it just life wearing us down? Pride? Our definition of what our final chapter should be like? Or, could it be something more we haven't taken the time to identify or consider?

During my life, having wasted a lot of days, weeks, and even a few years on occasion on my career, a few relationships, and life in general, I am in no position to preach, but I do have the right to share what I have learned. So here goes.

A great deal of the quality of life is determined by how we define and respond to adversity, failure, opportunities, success, problems, disappointment, rejection, achievements, and so many other life experiences. But in the end, we have a choice - let them define us or we define them according to our life philosophy, purpose, or mission.

We are all going to leave here with either stuff in our "in-basket" and/or unfinished business, words not said, and relationships that needed something done or undone before they ended. The only way to avoid any or all of these life mistakes is to be "perfect" and, trust me, none of us are or ever will be - no matter how egotistical, psycho, narcissistic, or arrogant some folks "don't think" they are.

So, life's nagging questions of us for everyone sooner or later are always: Why aren't you \_\_\_\_? When are you going to stop \_\_\_\_? When are you going to start \_\_\_\_? What are you waiting for? When are you going to fix \_\_\_\_? Got a few of your own? Now might be a good time to ask them. Life flies by faster than we can possible imagine and the opportunities we missed or passed up, things we didn't say or do just keep piling up faster and faster.

Hundreds of people every day are told they only have so much time to live. Know anyone like that? Is it you? Know someone who had to deal with this? The truth is, each of us is told this every day, not by physicians or counselors, but by life. And the final question I will leave you with is: ARE YOU LISTENING?

In His service,

*Tim*

To receive Tim's weekly FREE motivational booster articles, contact him at [www.timconnor.com](http://www.timconnor.com) with "please add me to your free booster e-mail subscriber list" in the subject line. Or contact him via e-mail to [michele@worldwidedrillingresource.com](mailto:michele@worldwidedrillingresource.com)

### Be Aware of Carbon Monoxide Hazards

Carbon monoxide (CO) is emitted in the exhaust of gas-powered engines such as portable generators, welders, compressors, and concrete saws. CO does not cause irritation, so a person can be overcome without warning.

Severe carbon monoxide poisoning causes neurological damage, illness, coma, and death.

Symptoms of CO exposure include headache, dizziness, drowsiness, nausea, vomiting, or tightness across the chest.

Prevent CO exposure by allowing adequate ventilation around engines - at least three to four feet of clear space on all sides and above it. Do not use generators indoors. Keep compressors outside, with plenty of hose available to use air-powered tools for the job.

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## A Foundation Support Home Run

C&G

Adapted from Information by Helical Drilling

The need for a new ballpark for the hometown fans of the Hartford Yard Goats, the Double-A affiliate of Major League Baseball's Colorado Rockies, meant overcoming construction challenges. The site selected for Dunkin' Donuts Park was a corner lot in a highly developed downtown area of North Hartford, Connecticut. The ballpark design consisted of a multilevel steel-framed structure with several large retaining walls.

Subsurface soil conditions consisted of up to 20 feet of granular urban fill, 2 feet of alluvial sand, up to 35 feet of soft to very soft varved silt and clay, overlying relatively dense glacial till and bedrock. The varved silt and clay layer is regionally known as "Connecticut Valley Varved Clay", which has a reddish color, but also high sensitivity and compressibility. The primary geotechnical challenge was the compressible urban fill and relatively soft varved clay layers. Excessive post-construction settlements exceeding the specified maximum allowable settlement of one-inch would have been caused by supporting footings on the unimproved fill and varved clay layers.

The owner required an economically viable foundation support solution which would not disrupt surrounding businesses with excessive noise or vibrations. The design team considered several foundation support alternatives, including driven piles combined with pile caps and grade beams, but Geopier GeoConcrete® Column (GCC) elements and shallow footings were selected as the most economical foundation support approach to address the project's highly populated urban setting, challenging subsurface conditions, and schedule demands. Geopier GCCs consist of high-capacity rigid inclusions, and allowed for shallow foundation support of the structure, instead of the more costly pile caps and grade beams.

The GCCs were designed to limit total and differential post-construction footing settlement to less than one-inch and 3/4-inch respectively, with a maximum allowable footing bearing pressure of four kips per square foot (ksf). Some late project design changes were needed to eliminate lightweight backfilling in the left field section of the structure. Design adjustments were made to the Geopier GCC system in these areas to increase the allowable bearing pressure to six ksf. This localized adjustment provided further cost savings on the project.

Helical Drilling installed more than 1400 GCCs with one Geopier rig and crew. They were installed using a patented displacement mandrel which did not require dewatering or generate excess spoils. Helical's designer engineered a structural fill pad (footing pad) beneath the footings to help transfer footing stresses to the GCCs and surrounding matrix soil. The footing pads also provided a stable subgrade for footing construction.

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# Notes from the Groundwater Guy

by *Thomas E. Ballard, P.G., C.H.G.*  
*Southeast Hydrogeology, PLLC*



### Bacteria are Everywhere!

Most often, we test for coliform bacteria in a well, and do not even look at other types of bacteria which can also cause problems. The simple fact of the matter is, you can't get rid of all the bacteria in a well - they occur naturally and are always present. The important thing is to track to trend the total bacteria counts in a well. If bacteria counts are increasing, it means the well is providing a favorable environment for bacteria growth and reproduction. and some sort of control measures need to be undertaken to avoid the water becoming cloudy, tasting unpleasant, or smelling bad - generally unhealthy conditions even if the bacteria present in the well are not pathogenic. Keep in mind, for every bacteria detected in a water sample, there are usually one million bacteria attached to the casing, screen, or wellbore.

Iron-related bacteria are very common throughout the United States and the world, and probably contribute to about 80% of all well plugging cases. They can form a slimy protective biofilm which, left untreated, can eventually fully plug a well. Sulfur-reducing bacteria can often be found in conjunction with iron-related bacteria, and tend to produce hydrogen sulfide gas - the rotten egg odor you can smell in some wells. Sulfur-reducing bacteria can also cause corrosion in steel-cased wells. There can be many other types of bacteria in a well, although most of them are harmless if present in low numbers.

Laboratory testing using the adenosine triphosphate (ATP) method can give a reliable indication of the total bacteria count in the well. Increasing trends for total bacteria should signal that well rehabilitation may be needed to address the issue.

If increased levels of iron are seen in the water pumped from the well or if well performance is steadily declining, a simple biological activity reaction test (BART) for iron-related bacteria should be conducted. If a rotten egg odor is present, indicating the presence of hydrogen sulfide gas and sulfur-reducing bacteria, then a BART test for sulfur-reducing bacteria should be conducted.

If any of these tests indicates a problem with elevated levels of bacteria, appropriate well rehabilitation should be undertaken. Such remediation should include some sort of brushing/swabbing to disrupt the bacterial growth, and an appropriate chemical application. Use of chlorine as a primary means to control bacteria is not recommended, as it can often cause the bacteria to "harden" down and make the problem more challenging for future cleaning efforts.

*Tom*

Tom Ballard may be contacted via e-mail to [michele@worldwidedrillingresource.com](mailto:michele@worldwidedrillingresource.com)

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## Keep the Hot Streak Going!

Adapted from Information by Lonestar Asset Management

G&O

Lonestar Asset Management, a leading private equity firm with a focus on identifying lucrative drilling opportunities, finalized funding for the acquisition of significant Texas acreage, most of which was previously held by Chesapeake Energy. By finalizing the acquisition, Lonestar was able to initiate an aggressive drilling schedule which began in January.



The company is seeking to continue and extend their momentum from 2018. To keep their hot streak, they are producing reserves which companies like Chesapeake never tapped into prior to leaving the area for other pursuits.

Lonestar CEO Beau Flowers stated, "Deals like this are exactly what we look for when evaluating prospects. This happens more often than you'd think when a new formation is discovered, much like the one they discovered in the Permian Basin."

In Texas, oil has its own ecosystem, allowing large and small corporations to coexist and run successful exploration and drilling projects together. For larger corporations, it's easy to drop the project and leave at the slightest indication of a more lucrative formation. This enables smaller companies with adequate resources to continue on with the projects.

Flowers added, "Big companies know they have to strike

while the iron is hot, plus they have the money to do it. They can just pack up and head out to the next boom. In this case, like most cases, they left a lot of oil in the ground . . . since we have their research and data to support the prospect's viability, it wasn't a hard decision for us to make. We'll basically pick up where they left off, and in this case, we really like where they left off."

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## Some Unusual HDD Terms

Adapted from Information by Melfred Borzall, Inc.

DIR

Like most industries, horizontal directional drilling (HDD) has its own unique jargon which has evolved over the years. The following terms come from short-hand, slang, or hijinks on the jobsite.

**Burp Hole** - Cranial opening on your buddy who has had too much soda and chili? No, it's a hole dug along the borepath to relieve downhole pressure to help prevent inadvertent returns or hydrolocking.

**Cycle Rods** - Sounds like it could be the shaft that connects pistons to a crankshaft in a dirt bike engine, but it refers to the action of "cycling" rods when pushing forward then pulling back drill rod in the hole, in repetition, to clean the path and avoid disruption.

**Doughnut** - Not the delicious treat, this is a rubber rod wiper at the front of the drill rig that wipes mud off the drill pipe as it pulls back.

**Fishing Tool** - Might be a name for any piece of rod and line equipment used by someone who is obviously not an experienced angler, but this is actually a specialty tool used to retrieve HDD tools which have broken off downhole.

**Fly Cutter** - The world's smallest samurai sword. Nope. This is a style of reamer with an open-blade configuration, also called a wagon wheel.

**Magic Box** - Cell phone (used for checking sports stats and responding to frequent communications from a spouse or significant other)? More commonly called a receiver or locator, this is an electronic instrument used to determine the position and strength of electromagnetic signals emitted from a transmitter sonde in the pilot head of a boring system, or an impact mole tool, or from existing underground services which have been energized. Also referred to as a Walkover System.



**Paddle** - Reminded of ping-pong? This is another name for a bit. Common types

of drill bits used in HDD include slant-face bits, slanted-face rock bits, rotary rock bits, and percussive bits. Other names used are blade, duck bill, and steer plate.

**Pig** - Not the farm animal, an HDD pig is a stabilizer barrel used to clean out a hole.

**Starter Rod** - Red Sox starting pitcher Eduardo Rodriguez, right? No, it's a threaded connector piece which allows for easy detachment and exchange of directional heads and reamers.

**Sucker** - Think this is a drill operator who waits until after tooling breaks to check for wear? Seriously, this is another word for vacuum. It is a stand-alone piece of equipment used to suck drilling fluid and slurry out of the pit or from burp holes while drilling.

**Swab** - Yes, it is a cotton-tipped device used for removing wax buildup from ear canals, but in HDD, this means to clean out a borehole for easier pullback of product pipe.

## Time for a Little Fun!

Can you identify which ads in this issue these two photos came from?

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# Mills Drag Bits

**Mills D6R Bolt-on Tooth Drag Bits** are offered from 12 1/4" and larger. The bit is designed for standard or reverse circulation (*flanged or threaded*). The cast steel teeth feature carbide inserts and are available in Straight type for medium soft to medium hard formation or Scoop type for soft to medium formation.

**NW6R Chevron Drag Bits** feature 1" thick blades and 1/4" carbide. The Chevron (*Apex*) style drag bit does not penetrate as fast as the step type, but will cut harder formations such as medium soft to medium hard formations.

**The NW6R Drag Reamer (Holeopener)** is designed to fit between an NW6R Connector and an NW6R Drag Bit Head. The NW6R Drag Reamer is available with 3 or 4 blades.

**NW6R Heavy Duty Drag Bits** have 1" thick blades and 1/4" thick carbide inserts. This bit is designed for rapid penetration in soft to medium formations while the thicker blades and carbide extend the life of the bit. Standard configuration is 3 or 4 blade but we also offer 5 or 6 blades in a variety of custom shapes and styles.

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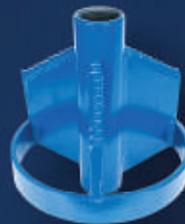
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by Thomas Kwader, Ph.D., P.G.



## What is the Geothermal Gradient?

The geothermal gradient is the rate at which the temperature in the earth increases with depth. An “average” geothermal gradient in the southern United States is typically about one degree Fahrenheit per 70 feet of depth. The actual gradient depends upon the type of sediment or rock, thickness of the earth’s crust, seismic and any volcanic activity present, etc.

In the last year, you may have seen on national television the lava flowing at land surface on the Hawaiian Islands that was approaching 2000°F (1093°C). Most of you also know about Yellowstone National Park and the geysers which spew boiling water every hour or so due to the high heat located much closer to land surface in this area.

Fortunately, most water well drilling professionals do not have to concern themselves with the “small” temperature rises in the few hundred or so feet to drill water wells. “Hot water” often contains high concentrations of dissolved solids (salts, metals, ions, etc.).

Over the last ten years or so, I have had the opportunity to deal with the consequences of geothermal gradients with some deep wastewater disposal wells along the U.S. Gulf Coast. These wells are approximately 10,000 feet deep where the actual temperature is near 250°F (121°C). Due to slightly corrosive fluid being injected, steel pipe lined with a fiberglass coating was utilized to protect the pipe. Due to the extremely high temperature in the injection zone, the lining and epoxy resin were impacted as a result of being at its thermal limit. The lining eventually began to “soften” and lose its strength.

Steep geothermal gradients can also impact the use of plastic pipe in some situations. If the bottom hole temperature is not known and needs to be determined, you may want to call a borehole geophysical logging company to run a continuous temperature profile of the hole to obtain an actual temperature profile of the borehole.

*Tom*

Tom Kwader may be contacted via e-mail to [michele@worldwidedrillingresource.com](mailto:michele@worldwidedrillingresource.com)

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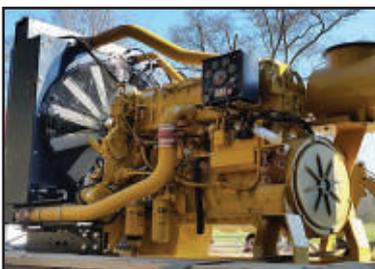
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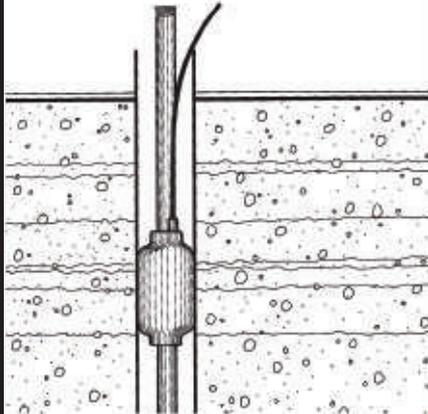
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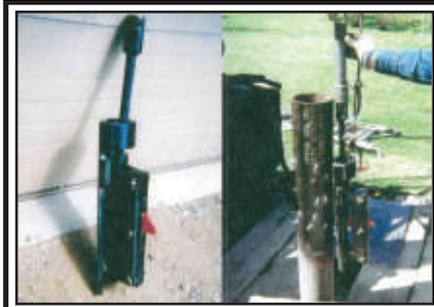
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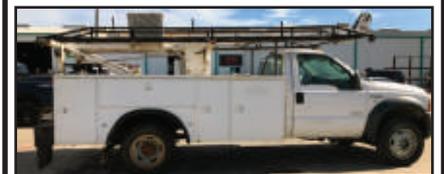
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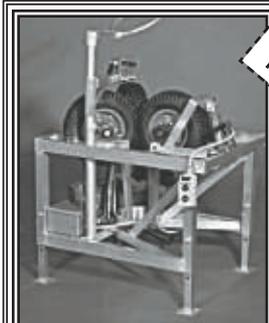
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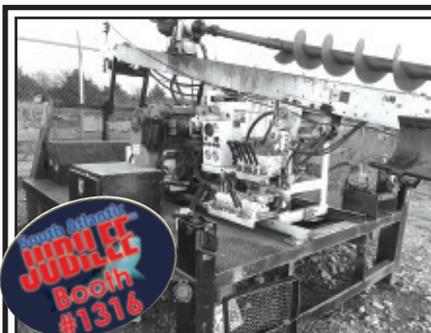


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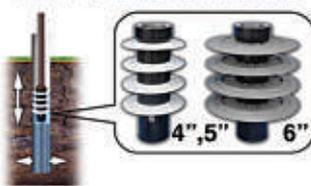


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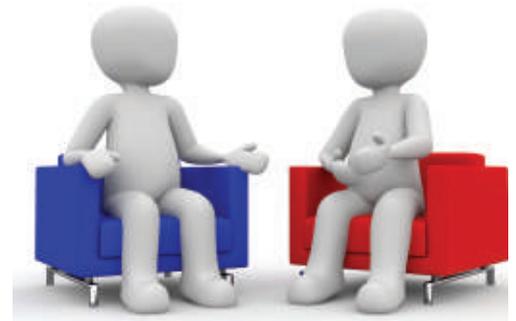
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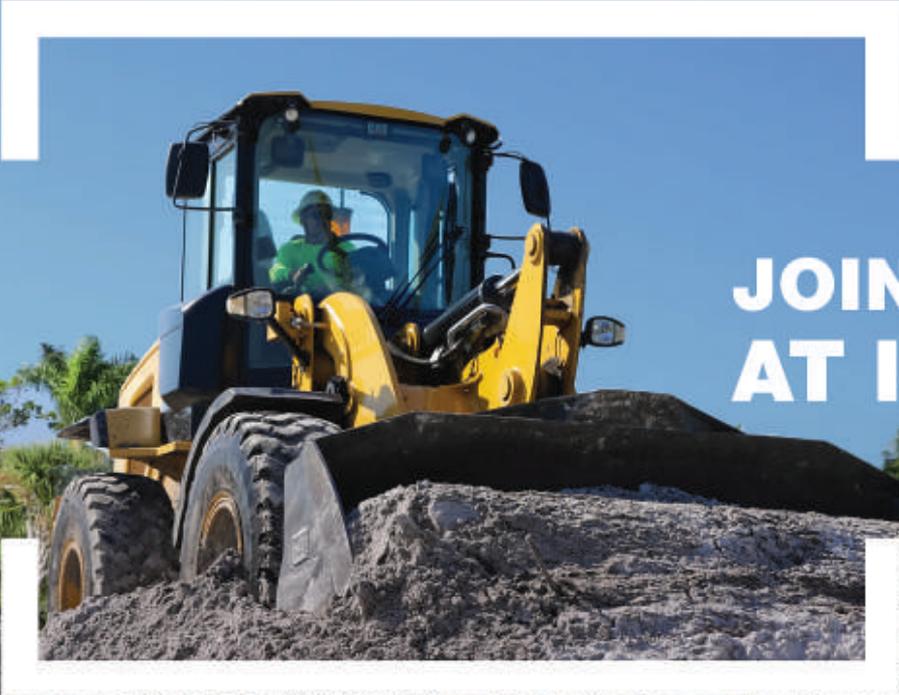
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SEMCO S8,000H Pump Hoist, 46' derrick, 2-speed winch, remote control, driver side pipe rack w/ratchet straps, triple-line option, 1,500' capacity sandreel, hydraulic oil cooler, power tong hook-up to the rear, hot shift PTO automatic transmission, 12' steel flatbed with heavy-duty bumper and receiver hitch, mounted on customer's Dodge 5500.

The SEMCO logo is stylized with the letters 'SEMCO' in a bold, white, sans-serif font. The letter 'S' is significantly larger and positioned to the left of the other letters. The logo is set against a dark blue background.

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A circular sign with a dark blue background and white and red text. The text reads: 'See us at South Atlantic JUDILLE JUDILLE Booth #1006'. The word 'JUDILLE' is written in a large, stylized, red font with a white outline.

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## DM250 Water Well Rig



### EASY TO MOBILIZE

- Dodge 5500 chassis is equipped with Cummins diesel engine, automatic transmission, and 4x4.
- A compact transport size makes the DM250 a good fit for residential work where limited access is a priority.

### SIMPLE & SAFE TO OPERATE

- The neatly laid out control panel includes an engine gauge, E-stop, hydraulic pressure gauges, friction control levers for mud pump and rotation circuits, and electronic throttle controls.
- The helper loads the drill pipe in the single rod loader using helper side controls to operate the jib and winch functions controls.

### POWERFUL & EFFICIENT

- Table assembly has clearance for 12-in. pvc casing and the holding fork and hydraulically operated adjustable breakout wrench make tripping out fast and safe.
- The tophead carriage uses rollers instead of slides providing smoother travel, easier maintenance, and longer life.
- Multiple mud and air compressor options include: 3LB, 5x5 duplex, centrifugal pumps, 85cfm development air compressor.



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