

WorldWide Drilling Resource®

Volume 13 August 2016

Home of Solid Gold Service™

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Details of this unit and more from SEMCO - Page 6.

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Ronnie,
Managing Publisher
ronnie@worldwidedrillingresource.com
With pen (computer) in hand...

Amazing isn't it? This so-called wonderful world we live in. Why is it then, we see so much destruction, both in our workplaces, vacation sites, and even at home? As this picture asks . . . What is your answer to that question? If we could just "live and let live", "judge not", but allow everyone to live their lives and we "accept who they are, as they are", don't you think this would be a much happier place? (Please send your comments to me.)



As this summer in the USA is now in full swing, with July 4th behind us, parades done until September, we must honestly get "back to work"; unless, of course, you have a vaca planned. If so, from all of us at *WWD*, ENJOY IT!

For the rest of us, it's back to work we go . . . Drilling goes in full force when the weather permits, and it surely permits now. Some say, "Oh the industry is in a downturn. There is no work." Want to know what my reply is? Oh sure you do! It's simply, "Exactly which drilling industry are you referring to?" Yes, exactly! There are many areas of drilling, and that is exactly why this magazine, *YOUR* magazine, was founded. It allows our subscribers to read, learn about, and get into different fields of drilling, so when there is a downturn in one, they can easily convert to their other areas of drilling. Remember the old saying, "Don't put all your eggs in one basket." Well it sure is a true one and one we can all understand. What field of drilling have you been pondering about? Let us help. Drop us a note, US Postal Service is still accepted here, e-mails too, and guess what else is? Yes, you figured that out mighty fast. It's the telephone! We love hearing from you. So, right now - yes - right now; stop what you are doing and contact us. Don't let another minute go by.

The next issue of *WorldWide* is going to be jam-packed with HISTORY! Have you ever looked at what happens each day in your life and realize, WOW, I'm making history with every breath I take. Yes you are! By now we probably have finished the editorial for our September issue of HISTORY IN THE MAKING, but maybe, just maybe, you still have a chance to tell your story to the *World*. Contact our wonderful editorial department today - Bonnie or Jasmine will be happy to help you. Then, don't miss an excellent opportunity to have your advertisement of your products, services, or equipment - or better yet, all of them, right there along with your HISTORY touting your great success. For the advertisements, contact our sales department and Brenda or Amanda will help you set up your schedule, block your space, and even get you over to our production department where your ad is prepared here for FREE! Can't beat that combination.

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Make Workers' Comp Work for YOU!

by Kyle Rehme

VolkBell Property & Casualty Insurance, LLC

Workers compensation (comp) is the single, most valuable piece of an employer's insurance program. There is more money to be saved or lost in the workers comp arena than anywhere else in insurance. As such, I spend

a lot of time with clients advising and going to great lengths to help them develop and refine their workers comp skills and knowledge to protect their employees and their company's bottom line.

Here are my eight favorite tips for anyone with a workers comp policy:

1. Before an injury happens, seek out doctors who have an experience in occupational medicine and understand the value of returning injured employees to work. Develop a first-name relationship with the office staff.
2. When an injury happens, require employees to report accidents immediately, no matter how minor. Keep a written record in your files, too.
3. After an injury happens, diligently and thoroughly investigate accidents as soon as they are reported. Interview witnesses apart from the injured employee and have them write and sign their own accounts.
4. Report the injury to your workers comp insurer within 24 hours.
5. Be compassionate and keep a positive attitude toward the injured employee as you stay in contact with

them. Immediately assign someone, preferably the supervisor, to regularly encourage the injured employee to motivate them to return to work.

6. Be cognizant of the injured employee's circumstances. If the injury is serious, it can be a life-changing event. Naturally, some employees may become depressed or angry and may need other assistance beyond what the treating doctor is aware of. You may have a perspective nobody else does!

7. Implement a well-defined return-to-work program. Be sure the injured employee, the supervisor, and fellow employees understand the work restrictions to avoid re-injury and facilitate a smooth return to productivity.

8. Understand the negative psychological impact on of disability payments. When injured employees become eligible for disability pay, they are being paid not to work. All too often, there can be a fundamental shift in the injured employee's motivation to return to work - especially if they don't feel valued or are depressed or angry.

9. Monitor the claim's progress. If you suspect a claim is not progressing for whatever reason, contact your insurance agent promptly. Your agent should be a great resource to facilitate and help you keep a claim on track, and close promptly.

It is our sincere hope and desire to encourage every drilling- and pump-related business, that workers comp can work for you! That is to say, it may become a positive business tool which adds value, security, and profitability to your bottom line and protects your most valuable asset of all - your employees. If you struggle, need help, or just want to improve your game - please reach out!

Kyle Kyle Rehme may be contacted via e-mail to michele@worldwidedrillingresource.com

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What Are You Missing?

Interpreting what we see is limited by our worldview.

Fresh from making mud pies, Pau and I were coated in dirt from our elbows to our fingertips. We walked into the kitchen to clean up for lunch, where we found Rafe leaning against the wall, shaking, and crying uncontrollably. His face, wet with tears, was red, and a line of drool hung from his open mouth.

I was shocked. I couldn't imagine anything that could make Rafe cry. He was powerful; twice my size, and twice my age, he was the first order boy I had ever been associated with. "What's wrong?" I asked.

He mumbled incoherently, so I asked, "Are you hurt?"

Just then, Frank, the brother between Pau and Rafe, walked into the room. "He isn't hurt. He said a bad word, and Mother washed his mouth out."

As a four-year-old, I couldn't conceive what that meant. I didn't know what a bad word was, nor had I heard of having your mouth washed out, but from the look on Rafe's face I knew it must be horrible, and I was terribly frightened. A moment later, the mother, my Aunt Doris, came in and herded Pau and I over to the sink to wash our hands.

A few days later, I was watching Aunt Doris clean the bathroom. On the counter I saw a beautiful glass bottle filled with a bright turquoise-blue liquid. Thinking it might be something delightful to drink, I pointed to it and asked, "What's that?"

"Mouthwash," she replied. I ran out of the room screaming. My worldview didn't yet include breath-freshening rinse; and so something called mouthwash could - in my mind - only be a poison for punishing boys until they cried.

We interpret the world with what we know until we learn otherwise, or find evidence to the contrary. Sometimes our minds change the actual things we see to match our worldview. I can't tell you how many times I've proofread something I've written only to complete my misspellings which seem glaring when someone else found them. My mind reads it the way I think I wrote it. (The cure comes by reading it aloud; I seldom misspell this way.)

How often does our mind do this? Apparently a lot, according to an experiment titled: *Perceptions of Incongruity* conducted at Harvard in 1949. Test subjects were shown normal playing cards and asked to name the cards by number and suit. After showing those cards several times, the experimenters introduced some anomalous cards into the mix - black hearts and diamonds, red spades and clubs. Remarkably, the test subjects did not notice the change. The brains would "autocorrect" and identify black hearts as spades or as if they were a red heart, and so forth with the other cards.

Johann Wolfgang Goethe, the German writer observed: "We see only what we know." It makes me wonder what else in the world we are not seeing right in front of us. I've heard stories of so-called native peoples, who have never been exposed to modern technology, being shown photographs. The natives could not make sense of the two-dimensional pictures, even those taken of things they knew. I also recall hearing of Pacific Islanders who could not see the background shapes of the early world explorers when first exposed to them. At best, some saw the sails as large white birds.

Recently, I saw the 1998 movie *Pleasantville* for the first time. It's about a teenage boy named David who moves the simple times depicted in a 1950s sitcom from black and white. He is given a magic television remote control, which sucks him and his sister into the sitcom. Even though they are now living in Pleasantville, everything remains black and white. The people of the town have a very narrow and uniform worldview. Over time, as David and his sister interact with the 1950s people and share 1990s values with them, it causes disruptions. The exposure to new ideas expands the knowledge/understanding of the citizens of Pleasantville, and in turn causes some parts of the town to become vibrant color.

It was this movie which got me thinking about the concept known as perceptual blindness. A so-called inattention blindness, it's a phenomenon in which we miss conspicuous events or hold an incorrect perception or memory of events or objects that were in plain sight - a lot of which speak of damn good eye witness accounts.

This makes me wonder what else are we missing, not seeing, because we don't have the worldview in which to perceive it? How often do our rigid social, political, or religious beliefs prevent us from seeing a terminal ves which are obvious to others?

In my presentations on innovation and creativity, I point out the best way to find these hidden connections - these new opportunities - is to increase the diversity of our knowledge. Epiphanies are more likely to emerge when we expose ourselves to divergent viewpoints and to as many new experiences as possible.

Robert

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

The Un-Comfort Zone II

by Robert Evans Wilson, Jr.



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Hot Off the Press

New Transportable Hardbander for the Drilling Industry

Rankin® Automation, part of Broco Rankin, introduced the Band-It™, a patent-pending transportable hardbander for the drilling industry. It is smaller, fully functional, and stands alone, so it can be transported by trailer or in the back of a ½-ton pickup truck.

Using Rankin's newly designed compact system instead of a headstock rotator for rotating the pipe, the Band-It is different from traditional hardbanders. It can service conventional pipe joints from four to six inches in diameter in the field, in a shop, or at a maintenance facility.

"We believe the Band-It is a game changer for the drilling industry," said Richard Ferry, president of Broco Rankin. "We searched for a way to produce the same quality weld bands as our other hardbanders while simplifying the process; [it can also] reduce the amount of time wasted in material movement and lower the overall cost of the unit. The end result was the Band-It, which sets a new paradigm for this industry."

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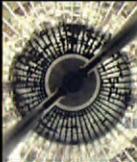
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SPOTLIGHT ON...

Nordic Drill

Nordic Drill started as J.M. Masse & Sons Inc, and was founded in 1947 as a water well drilling company. During the 70s and 80s, the company experienced growth with the second generation, becoming an industry leader in Quebec, Canada. The momentum had more progress for J.M. Masse & Sons as the takeover of the third generation saw numerous acquisitions, and the incorporation of dual rotary technology. Since then, a number of branches of the company began to operate under the name Pu tbec Group.



Alain Massé, Simon Massé, and Donald Massé.

In 2012, leaders of the company realized the rigs were too big, strong, and expensive for their needs. In a far-sighted effort to reduce costs, Pu tbec Group searched America and Europe for equipment perfectly suited to their use. The search ended in disappointment, and as the saying goes, necessity was the mother of invention. Pu tbec was inspired to manufacture their own, custom rig. A new branch was born, dubbed Nordic Drill. With 67 years of experience, the crew was equipped to design a piece of machinery focused on detail where being efficient. The result was a versatile, dual rotary, crawler-mounted setup featuring an angle side, basic tooling equipment such as a welding machine, hydrofrac pump, and aluminum toolbox, as well as multiple hookups for compressed air. The rigs capable of drilling diameters of up to 10 inches, and can adapt to smaller measurements. Labeled the DRC-10-A, it



The DRC-10-A, a Nordic Drill production.

quickly became so popular a waiting list was necessary.

Currently, four people are dedicated to the production of the DRC-10-A drill mode, but there are several branches working together to make Pu tbec one of the biggest water well drilling companies in east Canada. They pride themselves on designing the tools of today, with the fourth DRC-10-A on its way to completion. The company remains modest despite their achievements, focusing on continuous improvement to their star rig and remaining open to new concepts for drilling equipment developments. Their fourth Nordic Drill DRC-10-A will be for sale soon, and for the past 35 years and counting, the future certainly holds more innovations for the water well industry by Nordic Drill!

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BREAKING NEWS

Diedrich Drill Acquired



DIEDRICH DRILL INC.

Prairie Capital Advisors, Inc. announced Diedrich Drill, Inc. has been acquired by Cape Kauri Partners, LLC.

Founded in 1973, and located in LaPorte, Indiana, Diedrich is a manufacturer of Diedrich Drill brand drill rigs and tooling for the geotechnical, environmental, geothermal, and groundwater drilling industries. The company manufactures a range of drill rig models capable of reaching depths from 25-2000 feet. The company also manufactures a variety of tooling, including augers, drill rods, soil samplers, as well as other tooling used in underground site investigation and monitoring activities.

Prairie worked closely with Diedrich Drill's ownership and management team providing advisory services to prepare the company for sale and manage the marketing, negotiation, and closing of the transaction.

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WHO'S IN THE NEWS



The 59th Alberta Water Well Drilling Association Annual Convention & Trade Show presented Bert McEwen with the 2016 Maurice Lewis Memorial Award.

Additional announcements from Missouri University of Science and Technology, CURFLO, Inc., and Curry Supply Company are online now.

Visit worldwidedrillingresource.info/Whos1.pdf

Send your Who's in the News to: promotions@worldwidedrillingresource.com



Two for One

by Peter Tavino
Litchfield Geothermal

Geothermal drilling contractors have a new service to offer homeowners who are retrofitting their houses by drilling new boreholes and trenching them to the foundation. Drill crews can easily add a new treatment system for disposing the backwash from water softener systems. Many of these backwash systems flow into the concrete septic tank, where the salt and other chemicals can deteriorate the tank. New home systems are not allowed to backwash into septic systems, but older ones that do, find an alternative installation to be very costly, unless they are drilling new boreholes for geothermal heating and cooling.

Because an excavator will be on-site anyway to dig the connecting trench for the high-density polyethylene pipe supply and return to the drilled and grouted borehole(s), the extra excavator cost is minimal to install a new backwash acceptance system away from the concrete tank septic system.

We recently cored into the concrete foundation from a drilled borehole as usual with our ground-loop piping inside link seals for pressure testing. We added a third core, three feet above them, to allow the 3/4-inch water softener discharge to switch from the wastewater plumbing system to a new discharge pipe in the geothermal trench, which we were digging anyway.

From there, we installed a plastic junction box outside, and gravity fed the backwash into a four-inch PVC pipe, which led to new plastic infiltrator chambers. The sodium chloride or potassium chloride backwash now avoids the septic system and properly leaches out into the soil surrounding the plastic infiltrators.

Because this mini pollution source will not affect the sealed and grouted borehole, there is no separation distance required. Ours was about 20 feet away. There is a state requirement for the seepage to be at least 75 feet from the potable drinking well, and we did meet this separation distance with no additional digging required.

While excavating the trench, we confirmed it would be 12 inches above seasonal high groundwater. The four-inch PVC pipe, buried about a foot deep, was at least three feet above the geothermal loop piping below it. There was a minimal new seeding and hay area just for the 25-foot by 3-foot area of the infiltrators, located adjacent to and downgradient from the borehole trench.

We sized the volume of the four infiltrators at 47-gallon capacity each, to be 188 gallons, exceeding by 150% the daily discharge of 116 gallons per day from three treatment systems in the basement: one for the dolomite tank, one for the greensand tank, and one for the conventional saltwater container.

Our state of Connecticut Department of Energy and Environmental Protection published new regulations for these systems in 2014, which can be searched under "Low Flow Water Treatment Wastewater". These commonsense regulations can be a guideline for states which may not have regulated yet. The only filing requirement to the Health Department permitting the drilling is an As-Built Plan that can be incorporated into the As-Built of the Borehole(s) Plan. Besides the borehole location, we also located the "Low Flow Water Treatment Wastewater Dispersal Structure" as shown in the photo.

While we tout sustainable, efficient heating and cooling, we also tout almost free installation cost of a separate treatment system which saves folks' septic tanks. What great fellows you geothermal drilling professionals can be!

*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**.*

Pete

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



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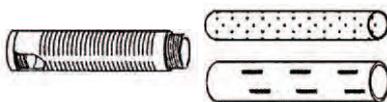


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Miners Win Race Against Time in San Francisco

Adapted from Information Provided by Mott MacDonald and the San Francisco Public Utilities Commission

In the late 1920s and early 1930s, miners used drilling and blasting to construct the 3.5-mile Irvington Tunnel through faults between Sunol and Fremont, California. The tunnel became a crucial link in San Francisco's Hetch Hetchy Regional water system. Approximately 85% of San Francisco's water has travelled through the tunnel; but this water supply was under threat.

According to Julie Labonte, director of San Francisco's \$4.8 billion Water System Improvement Program, "Although the Hetch Hetchy water system is truly an engineering marvel, some critical elements are seismically vulnerable. It's not a matter of if, but when a major earthquake strikes - we are truly in a race against time."

Since water from the original tunnel is essential to the Bay-area population, the tunnel has not been dewatered or taken out of service for a physical inspection since 1966.



A new tunnel was absolutely necessary; but gassy ground conditions, groundwater inflows, and seismic zones with squeezing ground made constructing another tunnel no easy task.

The New Irvington Tunnel was designed to run parallel to the original tunnel, with a steel liner and finished inner diameter of 8.5 feet. Due to the number of fault zones, it was excavated using a roadheader and drill-and-blast methods. The project required miners to be quick on their feet, and ready to adapt in uncertain ground conditions. According to Construction Manager Dan McMaster, "There have been days when we have started with drill-and-blast, and by that afternoon we have been into softer Class III and Class IV ground."

After two-and-a-half years of digging hundreds of feet underground, miners from Fremont, California, used a roadheader to grind through hard rock from one tunnel to another, meeting fellow miners coming from Sunol. It was the last of four reaches to be mined. The breakthrough hole signified the end of tunnel excavation on the project, a significant milestone.

McMaster said, "It was a real team effort, as well as having multiple tools in the toolbox to use to excavate and deal with the highly variable ground and groundwater that was encountered."

Construction on the project reached substantial completion in September 2015, and the New Irvington Tunnel is now officially in service. Not only does it provide a seismically sound alternative to the existing tunnel, the new tunnel will also allow the original tunnel to be taken out of service for much-needed maintenance and repair.

The new tunnel will carry 90 million gallons of water a day on average during normal operating conditions when both tunnels are in service. An additional 90 million gallons of water per day will also flow through the existing tunnel.

The New Irvington Tunnel was the last of three tunnels built to create a critical water lifeline able to withstand earthquakes on the Hayward, Calaveras, and San Andreas faults.

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Are Your Water Well Customers Vulnerable to Power Outages?

Adapted from Information by Constant Water

An estimated 30 million homes in the U.S. rely on wells for their water needs, and all of these homes suffer the same water well challenge: they lose water when they lose power. Constant Water was developed to alleviate this concern. It reassures water well users by automatically activating during a loss of power.

"Being without water is much more than an inconvenience," stated Company President Judson Walls. "It's a health risk."

The Constant Water system is an automatic backup water system which provides 40 to 120 gallons of pressurized fresh water to the home or businesses in which it is installed. In the automatic mode, the system senses the loss of power and immediately provides fresh water to every sink, shower, tub, and toilet. The manual mode provides a convenient backup for well pump failure, which is something even the most complex generator cannot do.

Low-flow well owners can also rely on Constant Water during the day while the well refills then refill the tanks at night. Additionally, Constant Water serves as a reliable emergency water supply for dwellings or businesses on unreliable public water systems. "Broken water mains are in the news all the time," Walls said.

The system offers many crucial features: it activates immediately upon loss of power; refills the tanks and recharges the battery automatically when the power returns; reduces dependence on generators; allows homeowners to purchase smaller, less expensive generators; features a small physical footprint; and is scalable to meet increased water requirements.

Walls sees global opportunities for the system in addition to U.S. applications. "We believe Constant Water can have a strong role in disaster preparedness, disaster relief operations, and provide support to developing countries struggling with reliable water solutions," he stated. "We want to establish relationships with international aid agencies, donors, and not-for-profit organizations working to solve water challenges around the world."

Well drilling professionals, plumbing professionals, and distributors can contact Constant Water, LLC for information on making Constant Water available to their customers.

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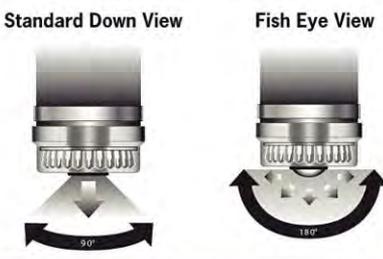
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NIOSH Offers Free Health Screenings to All Miners

Adapted from Information Provided by the National Institute for Occupational Safety and Health

The National Institute for Occupational Safety and Health (NIOSH) has implemented a program offering a series of free, confidential health screenings to coal miners throughout the United States. The campaign to provide early detection of coal workers' pneumoconiosis (CWP), more commonly known as black lung, began in April of this year and utilizes a state-of-the-art NIOSH mobile testing unit at convenient community and mine locations. NIOSH is working in accordance with its Enhanced Coal Workers' Health Surveillance Program. The public health outreach is a concentrated effort to battle a well-documented increase in this serious, yet entirely preventable, occupational lung disease, and also in response to new regulations requiring that health screenings be offered to surface miners. The initiative's first focus launched on April 11 and ended on May 20, in coal mining regions spanning Oklahoma, Arkansas, Texas, Louisiana, and Mississippi. The second focus will start the week of August 14 and end on September 9, 2016, in Western Virginia. Both local and individual outreach will be done in specific locations. All coal miners, including current, former, underground, surface, and contract, are encouraged to participate.

"We have recently expanded our existing health surveillance program from covering only underground miners to covering surface miners too," said NIOSH Director John Howard, M.D. "NIOSH has developed, staffed, and implemented the coal workers' surveillance program for years and will continue to reach miners throughout the nation in efforts to screen for the early detection of black lung."

The screenings will include:

- work history questionnaire;
- chest radiograph;
- respiratory assessment questionnaire;
- spirometry testing;
- blood pressure testing.

The entire process should only take about 30 minutes. NIOSH will provide individual miners with the results of their visit, which will remain confidential as required by law. Participation in the program will give coal miners an easy route to check on their health; a private report disclosing whether or not they have radiographic evidence of CWP; and crucial early-stage detection of chest problems other than black lung.

NIOSH has provided additional information about the program at the following website:

www.cdc.gov/niosh/topics/surveillance/ORDS/ecwhsp.html

Questions can also be answered via the toll-free number 1-888-480-4042.



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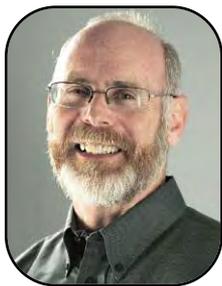
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The Importance of Groundwater Monitoring and Recovery Wells

Part 2

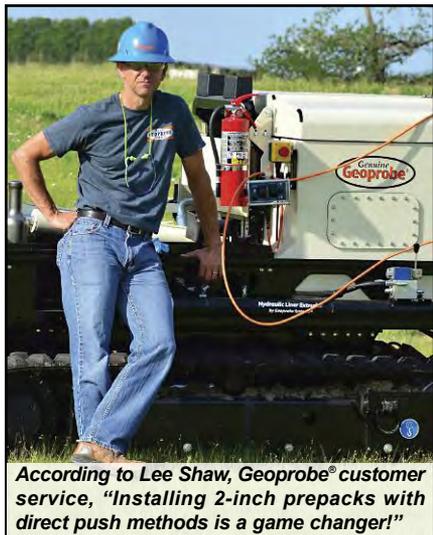
Submitted by **Wes McCall, P.G.**
Geoprobe® Environmental Geologist

Where Should the Wells Be Placed?

One of the most basic challenges to overcome is simply where the well should be placed and what part of the formation should be screened to achieve my monitoring or recovery goals. When working in unconsolidated formations, the hydraulic profiling tool (HPT) provides logs of electrical conductivity and relative permeability to define the local hydrostratigraphy. If volatile organic compounds (VOC) such as trichloroethylene (TCE) are the primary contaminants of concern, logging with the Geoprobe® membrane interface probe can provide logs of contaminant level and distribution. Cross sections or 3-D plots of the Geoprobe® hydraulic profiling tool and Membrane Interface Probe (MIP) logs can be used to accurately select the locations and depths for well placement and screen intervals.

When setting wells in saturated sand formations, it can be difficult to control formation heave. Heave or “blow-in” can occur when the center bit is pulled out of the throat of the augers or when the expendable point is knocked out of a direct push (DP) installed casing. In these situations, a pressure (P) imbalance between the formation outside the casing (high P) and the open bore of the casing (low P) causes the rapid flow of saturated sand, etc. into the open casing or auger string. This can also happen

if the DP casing or augers are retracted too quickly after the well screen and risers are inserted in the well bore. If this happens, the well can become bridged inside the casing or augers and it may be difficult, if not impossible, to retract the augers or casing without pulling the well out of the ground.



According to Lee Shaw, Geoprobe® customer service, “Installing 2-inch prepacks with direct push methods is a game changer!”

When formation conditions are such that heave is possible, clean water must be added to the casing or augers to balance the pressure inside the casing with the pressure outside in the formation. The water level inside the casing should be maintained at or above the static water level of the formation to prevent formation heave and loss of the bore/well.

Once well construction is completed, the clean water added to the well is purged out during development and water quality parameters are monitored to determine which representative formation water is obtained for sampling.

Let’s discuss the proper equipment for the job next month!



Phillip Ricker with Geo Lab in Dacula, Georgia, advancing 8.25-inch hollow stem augers with a Geoprobe® 7822DT for a 4-inch PVC recovery well installation.

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New Life for an Old Oil Field?

Compiled by Amy White, Associate Editor, *WorldWide Drilling Resource*®

Range Resources, the first company to drill the Marcellus Shale, is hoping for new payoffs from an old gas field in a different area.

Range Resources recently made a \$4.4 billion deal for Memorial Resource Development Corporation, and a previously unnoticed formation known as the Cotton Valley Formation, is central to the purchase. It is a conventional gas field near the U.S. Gulf Coast, the kind many onshore drilling contractors have vacated since Range Resources

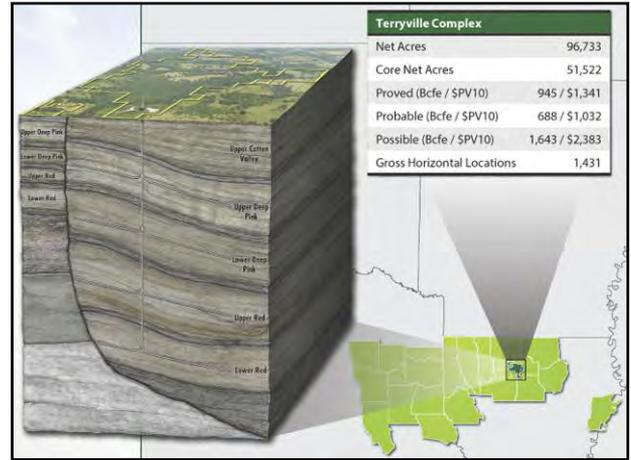
helped revolutionize Pennsylvania's Marcellus Shale with modern hydraulic fracturing techniques.

The Cotton Valley Formation is a tight gas play covering 220,000 acres of leases and drills stretching from East Texas to the Florida panhandle. The Cotton Valley has been drilled for decades, with the first wells dating back to the 1930s. The ancient sandstone formation's high-pressure spots in Louisiana and Texas include four different, thick-producing layers, along with high pressure which helps production. More than 21,000 vertical wells have been drilled into the play, and these wells have displayed long-lived, predictable production outcomes. Although it is primarily a natural gas play, some oil has also been produced.

Located in northern Louisiana, Terryville Field is part of the Cotton Valley. According to analysts, it has proven to be as competitive as the top Marcellus producer, and others in Appalachia. Terryville's success is part of an overall national trend of employing modern hydraulic fracturing to stimulate production in old fields.

Memorial has been using horizontal drilling, and reported wells last fall with 30-day initial production averaging more than 30 million cubic feet per day. Continued drilling success could position gas wells in the Cotton Valley among the best U.S. onshore gas wells of all time.

Economic factors are nudging gas drilling contractors in the direction of Louisiana as the boom in the Northeast faces setbacks. As of May 2016, Louisiana had more operational gas drilling rigs than any other state, just two years from a low point when Louisiana had about half as many rigs as Pennsylvania, and about a fifth as many as Texas, according to Baker Hughes, Inc.



A lot of gas demand is currently coming from Mexico, and from export terminals and industrial development along the Gulf Coast. Announcing the deal with Memorial, Jeff Ventura, chief executive, said Range Resources has gained a strategic advantage from its new option to produce and sell gas from a location in close proximity to these new sources of demand.

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:

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The "Idiots" Corner

by "Billy Bob Smith"

I have had it up to my \$&*(^%#@ with the 1% of the population determining the quality of life for the other 99% of us. Let me explain.

One person at some high school doesn't like the T-shirt I wore, so now NO ONE can wear a similar T-shirt.

One person objects to a Christmas display, and now every member of the community can no longer enjoy this display.

Twelve people blow up buildings in Washington and New York, and now 340 million people have to undress before they can get on a plane.

One person on a college campus has an issue with some silly rule that is of no consequence, and now every student has to obey this new rule.

Shall I go on, or have I made my point? Why do 99% of the country's population turn over their rights, privileges, and opportunities to the stupid 1%? Why do we give these idiots control of our lives?

How about a few more?

We can't call convicts or felons by this name; we now have to call them rule breakers, people who don't agree with laws, or some other stupid name.

We can't call them illegal immigrants anymore; we have to start calling them worldwide wanderers, or people without a home.

Give me a break! Before you know it, you know what words will be off limits? Here are just a few: Old men, pregnant women, people who eat too much, fire people - got it? I'll bet you, too, are fed up with us giving up control of our businesses, interests, hobbies, and life in general to these self-absorbed morons. Had enough, or am I the only one?

Billy Bob

Contact him via e-mail to michele@worldwidedrillingresource.com



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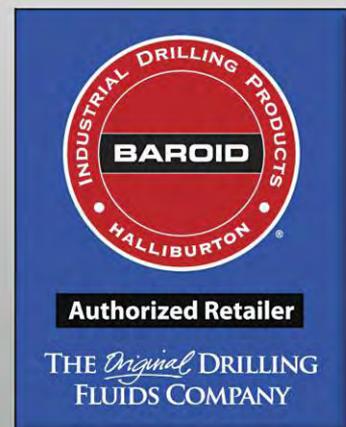
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Schedule 120 Plastic Pipe

by Bill Corey

Pentair Water Training Institute

Two years ago, I was asked by the State of Oregon to do a presentation on pipe sizing. I've got my standard pipe sizing presentation, which takes an hour or so, but they wanted something different. They specifically asked me to address Schedule (SCH) 120 plastic pipe.

Most pump companies, including the one I work for, use a pipe friction loss chart which has steel and plastic pipe on it. Most all use the Hazen-Wilhelm charts, which states as pipe gets older, it fluffs up, making the ID (inside diameter) smaller, so the velocity will go up. This makes the friction loss go up. More friction loss, less pressure. Again, most companies use a chart with steel and plastic pipe on it. The plastic pipe they use is SCH 40. The next size would be SCH 80, then 120, and 160. I have a chart which shows the different sizes for the different pipes. The OD (outside diameter) is the same, which means the ID is changed by the wall thickness.

SCH 40 PVC has the same ID as steel pipe. This makes the velocity almost the same. One chart I use has steel pipe at 5.05 and SCH 40 PVC at 5.11. It's 1/6 of a second difference, and when I ask my students if there's anyone who thinks they can take 1/6 of a second difference in the speed of the water without a spec a tool, no one answers. Yet when we look at the friction loss, the steel pipe has a most TWICE the friction loss as the SCH 40 PVC pipe.

Now here's where the problem comes in; most people looking at the chart see the word PLASTIC pipe and don't stop to think the wall thickness may have an effect on the friction loss! So the administrators of the program in Oregon wanted someone - me - to show the instructors why looking at wall thickness was so important. So I took the Hazen-Wilhelm formula and broke it down into each component.

One of the things you need to watch is what the engineer used for the value of "C". A book we use has a value of C at 140; another has it at 150. It may not sound like much, but the two charts are different and someone always wants to know which is right. The answer, of course, is both. It depends on whether you believe C is 140 or 150.

The big problem with the schedule of a pipe's wall thickness, which affects the velocity or speed of the water as it moves through the piping system. If the OD is always the same for, say, a two-inch pipe, then the ID will always be smaller. If the wall is thicker, the results will be faster moving water, resulting in more friction loss.

The instructors in Oregon were surprised to find the friction loss in SCH 120 plastic pipe was almost the same as steel pipe. They, like most, felt plastic pipe has a much better value of "C", so it has to have less friction loss. True, until you change the ID, which increases the velocity. You get the picture, right?

For more information and a copy of the formulas with instructions on how to change them for the type of pipe you're using, contact me at the e-mail below.

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Mars Rover Challenge

Adapted from Information by the Missouri University of Science & Technology and The Mars Society

Missouri University of Science and Technology's (S&T) Mars Rover Design Team was one of only 28 teams selected to compete at the University Rover Challenge (URC) at the Mars Society's Mars Desert Research Station in southern Utah. Teams from around the world competed to showcase the next generation of planet surveyors.

Sponsored by The Mars Society, the challenge was designed to demonstrate the fundamentals of remote robotic travel and task completion. Where on Earth could they hold such a competition? With

a harsh terrain closely resembling the rocky topography of Mars, the desert near Hanksville, Utah, was selected.

In addition to teams from the United States, Missouri S&T competed against teams from Bangladesh, Canada, Egypt, India, Poland, and South Korea. Teams were required to submit a video presentation explaining the design and cost of their rover. Overall, more than 300 college students took on the rugged Mars-like terrain of southern Utah and after two rounds of competition, and five different events over a three-day period, the Legendary Rover Team from Rzeszow University of Technology in Poland defended its title from 2015 with another amazing victory. Coming in second place was the WSU Everett Engineering Club from Washington State University (WSU) Everett, and third place went to the Continuum team from the University of Wroclaw in Poland.

The Missouri S&T Mars Rover Design Team won the first-ever Phobos Final with their rover named Zenith. This student-designed and -built rover used custom circuitry developed by the team. The team also machined the aluminum and carbon-fiber support structure, developed carbon-fiber wheels for terrain mobility, had the frame cut using water-jet technology, and used 3-D printing to create the gears and drill bits used in the rover's arm.



Photo of the Zenith Mars Rover by Sam O'Keefe courtesy of Missouri S&T.

Students were faced with numerous trials. The astronaut assistance task required teams to use the rover to collect lost tools left in the field and deliver them to multiple locations. The equipment servicing challenge required the rover to repair a mock equipment system. Tasks could include turning valves, pushing buttons, and reading pressure gauges. In the sample return test, the rover had to collect soil samples at selected sites in the field and use onboard instrumentation to perform a basic scientific evaluation to determine geological significance, or the likelihood of biological life.

URC judges were impressed by the exceptional level of both competition and comradery this year. The students demonstrated the combination of talent, passion, and world-class capabilities in one of the world's most unforgiving environments.

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Are We Taking Groundwater Infrastructure for Granted?

Adapted from Information by the National Ground Water Association

When it comes to drinking water infrastructure, out of sight, out of mind, seems to be the overall attitude. However, maintaining critical infrastructure is essential to providing comfort, security, goods, and services for the U.S. economy. "Even though groundwater and the subsurface environment is not visible, we rely on it daily," said National Ground Water Association (NGWA) CEO Kevin McCray, CAE. "The essential products and services of this unseen natural infrastructure must be managed and protected to sustain the well-being of the nation." Meeting water supply for the 21st century will largely depend on groundwater.

NGWA has created a five-step guidance for public supply well operators to use when collaborating with consulting hydrologists and water well system professionals to maximize their systems' water and energy efficiency. Here is a brief summary of the steps:

Step 1: Well Design - Efficiency begins with proper well design including water yield as affected by the lithology of the aquifer, casing diameter, and the well's water



intake area. Well yield is ultimately dependent on the ability of the water to flow through and out of the aquifer.

Step 2: Well Development - Well development is another critical process for maximizing the flow of water from the aquifer into the well. Well development opens the cracks, crevices, and pore spaces of the aquifer; repairs any damage caused during drilling; and removes the fine material from the immediate vicinity of the well.

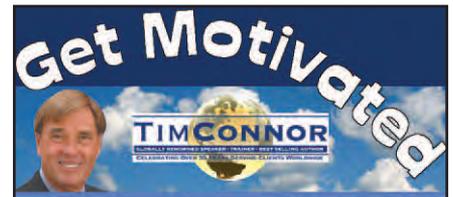
Step 3: Water Use Calculation and Management - Water use calculation is extremely important. Extracting more groundwater than what is actually needed, for any application, is wasteful and inefficient. Water use calculations show users their water consumption practices, informing them of where the most water is being used so conservation efforts can have the most impact.

Step 4: Pump Selection - Proper selection of the pumping system used to move water from the well to the first point of distribution is another critical factor. Pump sizing includes determining the aquifer's capability of supporting the desired flow rate, and the total dynamic head, which is a sum of pumping level, vertical rise, and friction loss.

Step 5: Well Operation and Maintenance - Failure to maintain the water well system in good working order can result in

inefficient operation, which ultimately results in higher overall operating costs. Research has demonstrated more expensive initial water well component costs may actually pay for themselves in the early life of the well.

An estimated 262,000 public water supply wells rely upon the natural storage of water in aquifers. Transmission of groundwater to a well's intake is used by 137,900 public systems serving a combined 102.6 million Americans. Sadly, civil engineers have graded the country's overall drinking water infrastructure with a D. Now would be a great time for America's businesses, groundwater associations, and policymakers to strengthen the country by rebuilding our infrastructure, before it fails.



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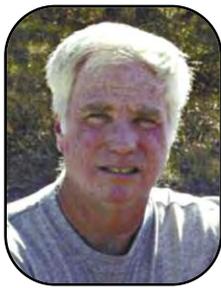
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The Price of Reliability is Simplicity

by Britt Storkson
Owner, P2FlowLLC

When I first started making computer controls, I thought customers would be impressed with a lot of the "bees and whistles" I gave them. Not only were they not impressed, they were repulsed.

People reject complexity not because they are "dumb" and cannot learn new things, because they simply do not want to spend the time and "necessity" it takes to learn a new product or concept. Most people, especially very productive people, have many things already "on the plate" and must decide which issues deserve their time and attention, and which do not, as it is not possible to deal with every issue satisfactorily.

Often, things are built far more complex than they need to be; complexity is not a true indicator of the builder's skill or intelligence. It's hard to make something simple, but it's worth the effort.

Several years ago, I made a pine wood derby car race timer. Pine wood derby is a competition where children carve the cars out of a block of wood which must weigh a certain amount, and are fitted with the same wheels so the cars are uniform to make the race as fair as possible. These cars are placed on a track that has lanes and barriers to keep each car in its lane as it travels down the track. The track is sloped, so gravity is the only propulsion. There is a gate at the beginning which holds the cars back; when the gate drops down, the cars go down the track.

The race timer unit I made had four independent timers corresponding with each lane (numbered 1-4). Each lane was triggered "on" by a switch pressed when the gate opened to let the cars roll down the ramp. Four "light beams" were installed at the end of each lane at the finish line. When the cars "broke" the light beam at the end of the lane, the timer stopped and this was the elapsed time (ET) down to 1/1000 of a second. There were rarely any ties because of this very fine resolution. The times were automatically recorded, and a printer was attached; so when a button on the timer was pressed, it printed out a "receipt" for the child. If the child knew the race number and the lane number, he/she would have a record (or receipt) of the race ET.

This was a simple solution requiring only two cables (one for the starting gate and another for the "light beams" at the end of the track) which had different sized ends so they could not be hooked up wrong. Everything was contained in a box about the size of a small shoe box and could be quickly and easily set up and taken down. This timer fully satisfied the need to time the races and was simple, inexpensive, and easy to use.

After a while, a programmer made a similar control. It did basically the same thing, but used three computers - separate personal computers - and a myriad of cables and displays. What was impressive to look at, it was constantly breaking down as a poor connection on one of the many cables would shut everything down. It was a so-called cut and time-consuming to set up. What this was a volunteer effort, if the organization were to pay for something like this, the cost would be astronomical - not to mention paying someone to fix it every time it broke down, which was quite often. As so, what if the programmer left the area? One poor connection nobody knew about could stop everything instantly. I am not condemning the fellow who did this, as it was a great system when everything worked, but it did not serve the needs of this group in other ways, as it was far too complex, unreliable, and could not be easily repaired.

The same goes for industrial controls. If you need water level detection, why buy a complex water detection system when a couple of wires and a resistor would do? By all means, if you need the complexity, buy it. And of course test everything thoroughly to make certain it will do what you need it to do. The simple solution is always the better solution.

Ouch! Jellyfish Sting

Adapted from Information by American Association of Retired Persons

In the movie "Finding Nemo," fish bounce off the bell-shaped tops of the jellyfish to move through them safely; humans are not so lucky, we usually collide with the jellyfish, suffering painful stings. If those painful tentacles are sticking to your skin, rinse with salt water and scrape off the barbs with something handy, such as a popsicle stick or a credit card. Depending on the type of jellyfish, vinegar can stop the stingers from continuing to give off that painful sensation. Any old myths you have heard may not always work, for example urine relieving the pain. Exercise extra caution when in the water. Just like you, the jellyfish are also enjoying the cool water.



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Test Your Knowledge of Hydraulic Fracturing - Here are the Answers!

Republished with Permission from Bakken Oil Business Journal & Beyond!

by Bob van der Valk, Senior Editor

1. What is hydraulic fracturing?

a) A new method of extracting coal from previously unknown sources, deep underground.

b) A way of extracting oil and natural gas trapped within shale and coal formations underground.

c) The injection of wastewater into underground wells for storage.

d) All of the above

2. Hydraulic fracturing uses wells which are drilled?

a) Vertically

b) Horizontally

c) Both vertically and horizontally

3. Which British Lord and ex-CEO of a major oil company promised to invest 'whatever it takes' in hydraulic fracturing?

a) Lord Green

b) Lord Brown

c) Lord Sutch

d) Lord Lucan

4. Why is sand injected during hydraulic fracturing?

a) Gas molecules bind to the sand and flow to the surface.

b) The sand keeps fissures open so the gas can flow.

c) The sand is used as an abrasive to clean the bore channel.

d) The sand absorbs chemicals trapped underground.

5. Approximately how many shale gas wells have been drilled and hydraulically fractured in the U.S.?

a) 45,000-50,000

b) 5,000-15,000

c) None - natural gas is a byproduct in drilling for crude oil.

6. Hydraulic fracturing a shale gas well requires:

a) 50,000 to 350,000 gallons of water

b) 350,000 to 1 million gallons of water

c) 1-3 million gallons of water

d) 3-7 million gallons of water

7. Hydraulic fracturing a shale (tight) oil well requires:

a) 50,000 to 350,000 gallons of water

b) 350,000 to 1 million gallons of water

c) 1-3 million gallons of water

d) 3-7 million gallons of water

8. Shale gas and oil wells are usually hydraulically fractured:

a) never

b) 10-30 percent of the time

c) 30-70 percent of the time

d) always

9. Shale gas wells are presently drilled at a spacing of:

a) 1 per square mile

b) 4 per square mile

c) 8 per square mile

d) 16 per square mile

10. Shale oil wells are presently drilled at a spacing of:

a) 1 per square mile

b) 4 per square mile

c) 8 per square mile

d) 16 per square mile

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Some Ideas to Help Make Your Competition More Cooperative

by John Christ
J.C.'s Drilling Consultant

I was trying to come up with an article idea and a local drilling friend (shout out to Carleen and Dave Yeager) suggested an article on competition. At least I thought that's what I heard. When I asked about some writing points, I sent my draft to them to review. The first thing Carleen asked was if I was writing about competition or cooperation. She was correct, it was an article on cooperation. Name change!

Carleen also shared a story about Dave: "When Dave was younger, he was always talking to his competition. Some thought he was annoying, but others appreciated that he wanted to learn from their knowledge. To have questions and have a person to talk to about how to resolve them and learn from their experiences is invaluable. Even now, he spends hours looking over well logs and studying what others did or didn't do. They may not be here to talk to anymore, but the information is still there to find. In these small family-owned businesses, we need each other to bounce ideas off and try to improve what we do for our customers. The days of subdivision wells is over. We no longer just move from lot to lot, we travel miles from county to county. Customers pick their drilling contractors for different reasons but, no matter what the reason, we shouldn't want our competition to fail the customer. The most important thing is the final product and protection of the groundwater!"

Do you complain about your competitors? What do they do differently than you? Can, or do, you talk to your competitors? Are you or they part of an association? Do they do any kind of training? Do they follow the local and/or state regulations? The questions could go on and on.

If you are not willing to talk to your competitor, you could be part of the problem. If this is the case, then nothing will ever change between you. This is why an association gives you a neutral format to communicate. What if your competitor is not a member? Why isn't he a member? He doesn't see the value? You don't know why for sure. This is an opportunity to talk to your competitor. If he says he can't afford the membership dues right now, this could also be an opportunity for you. Pay for his membership and make a friend. Don't complain, do something about it. Show him the value of having a helping relationship, rather than just reducing prices to take the next job from each other.

Now you both can drill in the same place. You can tell him some problems you have, and vice versa. Maybe he figured out a process to avoid or fix a problem, or vice versa. Suppose you're drilling and something breaks. It's going to take a week to get the part. Maybe your competitor has something to help until your part comes in. What if you are booked solid and someone calls and wants a well yesterday? Rather than lose out completely, sub it out to your new friend. Or, what if you are booked and one of your better customers calls with a "no water" problem. Can your new friend help you out? My point is, your competitor doesn't have to be an enemy, unless you want him to be.

*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 **WDR**.*

John

John Christ may be contacted via e-mail to michele@worldwidedrillingresource.com

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Sardonyx or Peridot for August

by Harry W. Short, Engineering Geologist

The August birthstone, sardonyx is related to sard and onyx, all of which are varieties of chalcedony (microcrystalline quartz). Its bands are colored white and brownish-red, and it is cut into cabochons of red- and white-striped beads 8 to 8.5 millimeters in diameter. The stones have a white base color, with light to dark orange-red stripes showing a different pattern on each bead.

Sardonyx is derived from the Greek word sard, meaning reddish-brown, and is commonly used to make cameos. The colored layer is the background, and the white part of the stone is used as relief. Roman soldiers would carve heroes such as Hercules in the stones, believing the stone would make them as brave as the figure in it. In later times, the stone was thought to bring elegance to its wearer and was of value to public speakers.

Sardonyx, because of its multicolored bands, was believed by early astrologers to be a gift from Saturn and has also been linked to Mars, perhaps for the same reason. The stone has always been popular, and even though it's quite common and never had a high value, it has been worn by the rich and the not-so-rich.

One story tells that Queen Elizabeth had a beautiful stone set in a gold ring with her portrait carved on the stone. The ring was presented to the Earl of Essex as a token of friendship and to assure him of her help if ever needed. The Earl was imprisoned for treason and beheaded. He tried to send the ring to the Queen for help, but it ended up in the possession of Lady Nottingham, who was an enemy of them both. The Queen learned the truth from the deathbed confession by the Lady of Nottingham.

Sardonyx is found in India, Germany, Czechoslovakia, Brazil, and Uruguay. In the United States, sardonyx is found in the Lake Superior region of Minnesota, and in Oregon.

August actually has another birthstone named peridot, which is a transparent gem form of olivine composed mostly of magnesium and iron silicates. The color ranges from olive to lime green. The green shade is caused by iron, which shows a brown tinge when the iron content is high. It's optional as to which gemstone to select, but sardonyx is the usual choice for August.

Harry

In memory of Harry Short. His articles will continue posthumously.

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In Memoriam

Sarah Jane Belshaw (1966~2016)

The management and staff of *WWR* was immensely saddened to learn from the Ontario Ground Water Association (OGWA) of the sudden passing of Sarah Jane Belshaw on June 2, 2016.

Born in Scotland, and raised in Georgetown, Ontario, Canada, Sarah enjoyed soccer, friends, and family. When she became president of Solinst Canada Ltd., she proved to be a great leader, motivator, and mentor. She was always compassionate and understanding, with a strong business sense and drive.

Sarah was known for her infectious laugh, kindness, and generosity. Her enjoyment of life, her friends, and her continual home and cottage renovations and improvements will be remembered by all with great fondness. She was an inspiration and will be greatly missed.

Sarah is survived by her son Scott; daughter Jenna; brothers Richard and Peter (Lygia); and nephews Patrick and Ewan. She was predeceased by her parents Douglas and Jean Belshaw.



John David Butt (1957~2016)

The burden of announcing the passing of John David Butt on June 23, 2016, also fell to the OGWA. Born in 1957, John was the owner and manager of DrillWell Supply Ltd. from 1989 to 2011. He was a hardworking business owner, a great proponent of the groundwater industry, and a supporter of OGWA.

John is survived by his wife Maura; daughters Ciara and Claire; one grandchild; sisters Delores (Bradley) and Diana (Dean); brothers Paul (Brenda) and Jason (Beverly); and several nieces and nephews.

The management and staff of *WWR* extend their condolences to John's family, friends, and colleagues.



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Oil/Water Exploration by Harold White

Every so often, I find an article about some oil company finding a new oil field in one of the many states I have done research in since the mid-1950s. I read to find where it is exactly, and "wow," I know the spot! I have always wanted to get some help and drill that area. It would have been great. The fields are estimated to hold billions of barrels of oil. Well, it is nice to know and I get a little feeling of satisfaction, and a little feeling of loss. Oh well, I know where there is more.

I remember back when it was being said there was an oil shortage and all the good fields were drilled, so we were

going to run out of oil, and the gas- and oil-powered equipment, cars, and so on would just be left behind along the roads. It was said we needed a different source, like electric, solar, wind, and so on. My statement at the time was less than five percent of the oil had been found, and more was being made everyday.

When I am looking to find water, I often locate oil and gas veins; sometimes creeks of oil or gas, sometimes rivers. So, I know where there are a lot of big areas. To get a lease should be easy.

On another note, here in Oregon, the mountains have snow and the rivers are running fast and deep, clean and cold. The salmon are migrating upstream from the ocean. They are a sight to see. I am in Eugene, Oregon, so the salmon have come a long way up the river from the ocean, into the Columbia, up to the Willamette by Portland, up the Willamette to this area, and on up into the mountains east of here,

and find little tributaries along the way to go up to their birthplaces. Salmon always go back to their birthplace. If they are raised in a hatchery, they come right back to the hatchery after about four years in the ocean. What a memory or instinct.

*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 **WDR**.*

I just wanted to call and say my wife and I support Harold 100%.

John Stoicam
Ryegate, MT

Harold

Harold White may be contacted
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Environmental Monitoring

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



Potable Water Sources - Rivers, Lakes, and Groundwater

Most towns or cities rely upon water from a single source, such as a river, lake, or groundwater. There are advantages and disadvantages to each of these sources. Relying on any single source is a form of gambling that your source will always be there for you.

Surface water, rivers, and lakes often have a single point of withdrawal. The area around the intake structure must always be protected from sources of natural pollution (fish kills, algae, bacteria, etc.). If contamination occurs, the withdrawal of water must be stopped until the threat passes, or the water can be treated to drinking water standards. Towns receiving water from a river often must shut down if a chemical spill occurs upstream, until the threat passes - such as plumes from chemical, sewage, or petroleum facilities.

Rivers and lakes can dry up due to climatic conditions and/or overdrafting where the water demand exceeds rainfall conditions. Groundwater supplies (wells) are also vulnerable to contamination, causing wells to be shut down for long periods of time or permanently (from nitrates, chlorinated solvents, etc.). Fortunately, most towns have multiple wells which are part of an integrated supply system, and the load can be accommodated by other wells.

One of the issues with aquifers is there is a wide range of well yields for different types of aquifers depending upon the depth, thickness, and permeability of the aquifer. Well yields can range from 0-2000 gallons per minute or more. Many fractured rock wells yield as little as 1 gallon per minute, but it equates to 1440 gallons per day - usually enough to supply a household. Large populations in areas of low-yielding aquifers or coastal areas have a difficult time relying on large volumes of groundwater, due to large seasonal demands. Examples include Atlanta (low aquifer yields) and Baton Rouge (saltwater intrusion). You may have noticed people like to live where water supplies are often limited (coastal areas, California, southwest Florida, etc.).

The price of all potable water is bound to increase as demand increases and we build pipelines to transport water from where we have it to where we need it. Water supply systems should be diversified to ensure long-term reliability.

Tom

Tom Kwader may be contacted via e-mail to michele@worldwidedrillingresource.com



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Left: Steve with Northwest Flattanks of Choteau, Montana, congratulates Carol and John Larson of Larson's Water Well Drilling and Servicing of Loughheed, Alberta, Canada, on the purchase of a new water truck. Right: John with crew of Ethan, John, and Nathan.

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Product Spotlight

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Gotthard: What does it Take to Construct a World Record?

Compiled by Jasmine Dodds, Associate Editor, *WorldWide Drilling Resource*®



Photo courtesy of Herrenknecht.

The Gotthard Base Tunnel was finally opened for inaugural rides on June 1, 2016. Five hundred Swedish citizens, chosen by drawing, climbed upon a train to travel down the 35.5-mile tunnel bored under the Alps. This project is the longest and deepest traffic tunnel in the world (surpassing Japan's Seiken Tunnel), calling for over \$12.5 billion, 2600 workers, and over 20 years to complete.

So what exactly is required to tackle such a mammoth undertaking? As it turns out, you need something never quite seen before. That's right - four incredible gripper tunnel boring machines (TBMs), Heidi, Sissi, Gabi, and Gabi II, were built by Herrenknecht of Germany with this specific project in mind. Before the machines' creation, there simply wasn't equipment durable enough or powerful enough to do the job. Over 23 million tons of rock were removed during the drilling and blasting of the tunnel, which is enough rock to rebuild the pyramids of Giza five times over. Average monthly tunneling performances peaked at approximately 1837 feet, with penetration rates of nearly a half inch per revolution. The daily performance record belongs to Sissi, who tunneled about 125 feet in just 24 hours. The TBMs reached breakthrough with vertical and horizontal deviations of mere millimeters, the same degree of accuracy achieved by a marksman hitting a coin at a distance of 6561 feet.

The Gotthard Base Tunnel is scheduled to go into full operation in 2017 after scheduled test runs are finished.

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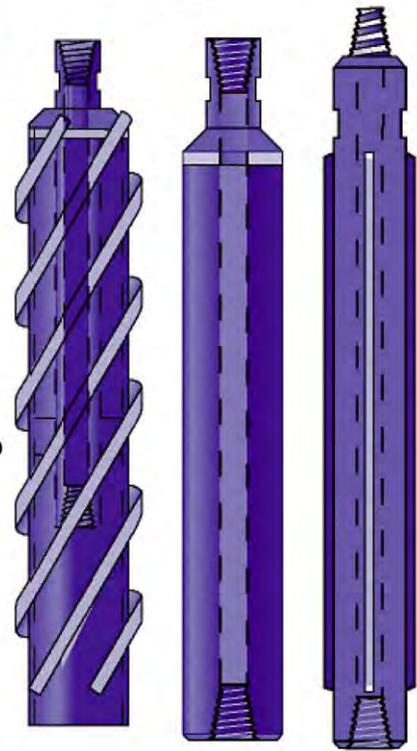
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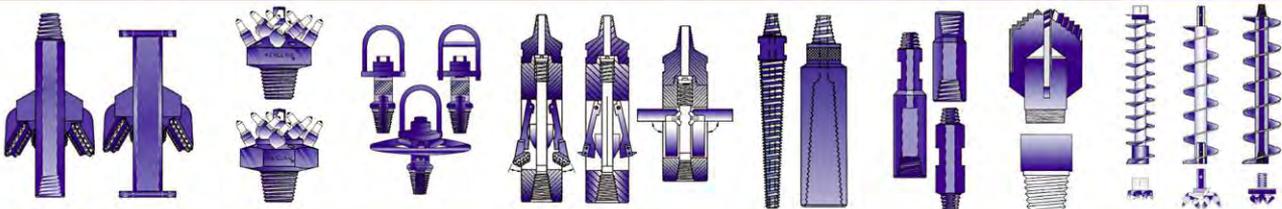
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Are You Stuck on Your Own Pedestal?

by Tim Connor

We all have a certain degree of "self-adornment," but the real question is - is our self-made pedestal beyond humility, wisdom, compassion, and the ability to step off this podium when essential or even needed to achieve success, happiness, and inner peace?

During my world travels, I have met hundreds of egomaniacs, as well as thousands of real, compassionate, kind-hearted people. So the question I would like to address is simply - are you stuck or trapped by your self-aggrandizement and an unwillingness to step off your pedestal when appropriate, necessary, or beneficial?

I guess the first thing is, are you on a self-created pedestal? If you are, why did you put yourself there and how is it working for you as you look down on everyone else in your life? Or, are you on one that someone else put you on?

What exactly is a pedestal? Here's my definition as it relates to this article: *A self-created position above, or higher than, others when it comes to integrity, humility, intelligence, compassion, or understanding.* It is when you feel better than others in some way, creating emotional distance and separation between you and those around you.

Why do people put themselves on a pedestal? Is it the need for approval, acceptance, or low self-esteem? Is it arrogance, ego, and the need for power, fame, and success? Yes, and yes.

Yes, some of us might have more fame, power, money, and stuff than others but, in the end, does any of this make us a better person? I don't think so. As I said, I have met thousands of people around the world and yes, many judge others by what they have, own, or do, but in the end, I don't believe any of this makes us better; wealthier, famous, popular, maybe - but these don't equal better as a fellow human being.

I have met wonderful people who had little or nothing, and spent the majority of their lives giving to others, supporting others emotionally, and sharing themselves unselfishly and yes, I have met many very selfish folks who wouldn't give anyone the time of day or any help when needed or requested.

What's your story? Are you focused on stuff, the short-term of life, what you have to gain or want, or are you leaving behind a legacy of love, caring, and support to those who cross your path?

If you are on a self-made pedestal, I guarantee it will sooner or later come crashing down. If you are on a pedestal someone else put you on, I guarantee sooner or later they will wish they hadn't put you there.

In His service,

Tim

To receive Tim's weekly FREE motivational booster articles, contact him at 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:

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

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Drilling Engineers in Fort Collins, CO, designed a barge specifically for their Geoprobe® 7822DT to complete a pre-feasibility study on Erie Lake Reservoir in Erie, CO, to examine the potential for the construction of a new dam. The geotechnical investigation will also help determine if future expansion of the reservoir is feasible.

According to Rick Rogers, Owner of Drilling Engineers, "The 7822DT and barge setup worked beyond our expectations."

The purpose of the study was to obtain samples of soils and bedrock inside the existing footprint of the reservoir to evaluate whether the material was suitable for building a new dam. "Core rods were used as spud bars to hold the barge in place while we drilled," Rick explained. "We used our 7822DT and advanced 3.25-in. ID hollow stem augers to approximately 30- to 40-feet in depth or 10 feet into the underlying claystone bedrock." Soil samples were obtained with split spoon and other samplers.

Drilling Engineers designed the barge so it could be transported with their equipment carrier. They can unload, assemble, and load the drill in one day. The barge is equipped with a five-horsepower engine.

"Because of its small size and light weight, we can complete multiple projects that could not be accessed with a truck-mounted rig," Rick added. As well as the geotechnical barge drilling project, Rick said they hope to complete river/estuary sediment sampling with the 7822DT/barge combo for environmental investigations in the coming year.



A total of three holes were drilled to approximately 40-50 feet below the water surface into underlying bedrock to collect soil and bedrock samples. Drilling Engineers used 3.25-in. hollow stem augers with their 7822DT on a barge built for the project on Erie Lake Reservoir in Erie, CO.

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"Drilling Engineers purchased our 7822DT in 2009, and we've found it to be versatile in its design for both environmental and geotechnical drilling projects. Because of its small size and light weight, we can complete projects that can't be accessed with truck-mounted rigs."Rick Rogers, Owner, Drilling Engineers, Fort Collins, CO

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A Geoprobe® Quick Change Hook and Overshot Clevis Assembly adds to the multipurpose function of the dual winch kit now available for the Geoprobe® 7822DT. If you're setting up for rock coring, you'll immediately see the benefits of a secondary winch dedicated to wireline work. Check out our website to find out other reasons why the 7822DT is the most popular direct push machine in the world!

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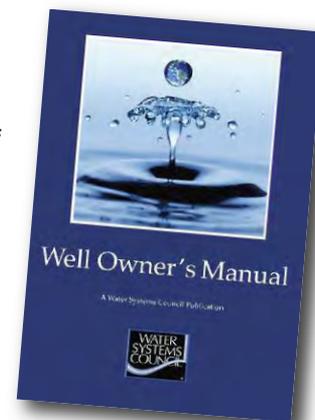
Educate Your Water Well Customers

Adapted from Information by the Water Systems Council

Are you looking for a way to educate your water well customers about the responsibilities of being a well owner? Look no further, because the Water Systems Council (WSC) has you covered. The national nonprofit organization has published a new *Well Owner's Manual* which is free to well owners across the U.S.

WSC received a grant from the U.S. Environmental Protection Agency (EPA) last year to provide technical assistance, training, and educational programs to owners of private and small community water wells. A portion of the grant was used to produce the new 32-page manual.

The manual includes sections on water well systems, well maintenance, selecting a well contractor, protecting your wellhead, water well testing, and understanding water well test results. It also includes a well owner's checklist, as well as information on the wellcare® Hotline, a free hotline which provides advice on protecting, maintaining, testing, and conserving drinking well water supplies.



"WSC is committed to ensuring that Americans who depend on water wells have safe, reliable drinking water," said Margaret Martens, WSC executive director. "The EPA grant has enabled us to expand our efforts to educate well owners, consumers, and policymakers about water wells and the importance of protecting America's groundwater resources."

WSC can help you provide customers with a wealth of information, including how to take care of a well following a natural disaster or emergency. The organization's HELP System for Emergency Response information packets educate water well owners on how to recover their wells if disaster strikes.

Floods, tornadoes, oil spills, and wild-fires can wreak havoc on a water well, and well owners need to be informed about the potential impact on their wells and what protection measures should be taken.

These information packets include the following information:

- Video - Disinfecting a Well
- Public Service Announcement - *What Private Well Owners Need to Know About Your Water Supply in Case of a Natural Disaster.*
- Information Sheets on emergencies, disasters, and wells; disinfecting a well; drought, and managing a flooded well.

The information is free and can be downloaded from the wellcarehotline.org website or acquired through the state's emergency response and public health agencies. WSC has an interactive map to provide consumers with agency names and contact information.

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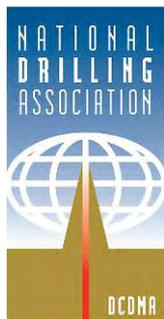
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Get ready to attend the National Drilling Association Convention September 15-16, this year in Pittsburgh, Pennsylvania, at the Hilton Garden Inn. There is a golf outing set for Thursday, with cocktails with the exhibitors from 5:00-6:00 in the evening. This is followed by the President's Dinner, award presentations, and entertainment.

Friday's agenda includes presentations on exploring a fault zone using high-angle drilling and geophysics; infiltration testing practices for green stormwater infrastructure; drilling with diamond bits; outdoor static displays; interactive workshop "From Zero to Coring"; along with roundtable discussions.

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DRILLING TO SAVE SALAMANDERS AND SWAMPS

Compiled by *Jasmine Dodds, Associate Editor*
WorldWide Drilling Resource®

The Atlantic Coast Pipeline (ACP) is an interstate pipeline intended for natural gas transmission, which would serve a significant number of public utilities and the expanding energy needs in Virginia and North Carolina. The natural gas transported by this project would be used to generate electricity, heat homes, and run local businesses. The ACP would increase the reliability and security of natural gas supplies, and transport the gas safely.



Above: the Great Dismal Swamp Wildlife Refuge. Photo courtesy of U.S. Fish and Wildlife Service Northeast Region



Right: Cheat Mountain salamander, one of the populations preserved thanks to HDD techniques.

The project would be about 594 miles in length, and include a connected pipeline (also known as a latera) bringing additional supplies to Hampton Roads. Another two, shorter laterals will connect to Dominion Virginia Power electric generating facilities in Brunswick and Greensville Counties. In both West Virginia and Virginia, the pipeline would be 42 inches in diameter, while in North Carolina its diameter would be 36 inches. The Hampton Roads latera would be only 20 inches in diameter, and the two shorter laterals would have a diameter of 16 inches. Three compressor stations have been out-lined for this project: one at the beginning of the pipeline in West Virginia's Lewis County; one in central Virginia's Buckingham County; and a final one near the Virginia-North Carolina state

line in Northampton County, North Carolina. The pipeline's capacity is expected to be 1.5 billion cubic feet of natural gas per day.

The route for the pipeline has generated plenty of discussion, requiring several reroutes to protect various environmental and historical interests. The team continues work to fine-tune the proposed pathway, surveying and obtaining information from affected landowners to determine the best route with least impact. Horizontal directional drilling (HDD) has been called on to save several environmental concerns, such as the Great Dismal Swamp National Wildlife Refuge, Cheat Mountain, and the George Washington National Forest. Both Cheat Mountain and the George Washington National Forest are home to two unique species of salamander, which would be destroyed if the pipeline company didn't utilize HDD methods. These are only three of the countless obstacles the ACP is aiming to route around.



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However, "the major challenge," according to Daniel A. Weekley, Dominion vice president of corporate affairs, is crossing the Appalachian Trail, which is overseen by the U.S. Forest Service. The pipeline company, in an effort to minimize impact, has proposed using HDD to bore 4500 feet through the mountain, about 800 feet beneath the scenic trail and parkway. Its contingency plan, which was requested by the Forest Service earlier in the year, is to drill a second hole alongside the same right-of-way and, if that were to fail, use an alternative method of crossing via a shorter, shallow tunnel which would require additional tree clearing, but not within 350 feet of the trail or 600 feet of the parkway.

The Atlantic Coast Pipeline is expected to be in use by late 2018, and although there is no perfect route, the ACP team can certainly be commended for the energetic efforts to keep the landscape and its inhabitants as undisturbed as possible.

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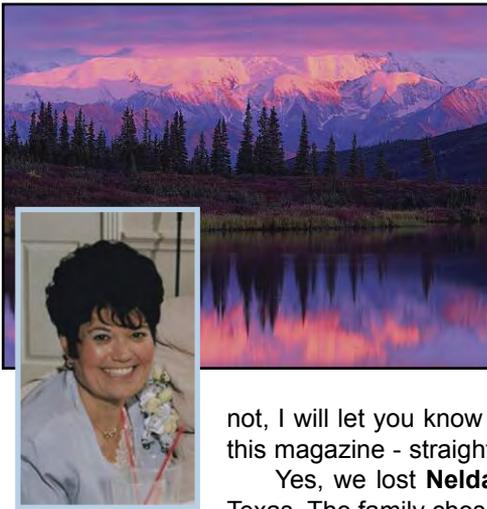


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Ronnie's Real World



Life is certainly far too short. It doesn't matter what age you are. Newborn, child just walking, young adult, middle age, or old age; life is NOT guaranteed to anyone for any length of time. It is yet to be determined why, when, or even how our life span is determined. I just know, it is important to live each day to its fullest. Work hard, enjoy time with family and friends, stop by and visit the neighbor, help an old lady or man open the door, take them out to lunch; each act of kindness will open your life up to even better meaning and happiness. Believe me, it has opened mine up.

If you pay attention to Facebook, and you have "LIKED" our Travel Facebook Page, you saw a posting about our industry losing a dear friend. If not, I will let you know here and let you also know, next month a full appreciation for her will appear in this magazine - straight from the heart of this magazine.

Yes, we lost **Nelda Vanderford** on June 30, 2016. She died peacefully at her home in Magnolia, Texas. The family chose Rosewood Funeral Home in Humble, Texas, to handle the arrangements. Go to their website, <http://www.rosewood.cc> where you can leave condolences and let the family know how much she meant to you.

The family accepted visitors on Wednesday, July 6th, and her final resting was on Thursday, July 7th. Little did anyone know, she was a stockholder in **WorldWide Drilling Resource, Inc.** since its inception September 3, 2003. She will be greatly missed by not only her family and friends, but her family here at **WDR** as well. One has to be in the right frame of mind to honor such a lady, and right now, my heart is bleeding for her, and I just can't do it. I'm sorry, but I have to put it off until the September issue and appreciate your understanding.

And that truly is... Ronnie's Real World!

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Frequently-Used Geological Terms Part 53

Glossary Adapted from the Dictionary of Geological Terms

M

Mining - The process of extracting deposits from the earth.

Mining Engineering - The planning and designing of mines taking into account economic, technical, and geological factors.

Mining Geology - The study of the geological aspects of mineral deposits, with particular regard to problems associated with mining.

Miocene - An epoch of the early Tertiary period, after the Oligocene and before the Pliocene.

Mixed-Base Crude - A crude oil in which both paraffinic and naphthenic hydrocarbons are present in approximately equal proportion.

Mixed-Layer Mineral - A mineral whose structure consists of alternating layers of clay minerals and/or mica minerals such as chlorite, made up of alternating biotite and brucite sheets.

Mohole - A proposed borehole to penetrate into the earth's mantle below the *Mohorovičić Discontinuity*.

Mohorovičić Discontinuity - The boundary surface separating the earth's crust from the subjacent mantle. Its depth ranges from about 3-6 miles beneath the ocean floor, to about 21 miles below the continents. It may reach more than 35 miles under some mountain ranges. It is named in honor of Croatian Seismologist, Andrija Mohorovičić.



The Mohorovičić Discontinuity, named for Andrija Mohorovičić, was the second major boundary to be discovered below the earth's surface using seismology.

Mohs Scale - A standard of ten minerals by which the hardness of a mineral is rated. The scale runs from softest (1) to hardest (10).

1. Talc
2. Gypsum
3. Calcite
4. Fluorite
5. Apatite
6. Orthoclase
7. Quartz
8. Topaz
9. Corundum
10. Diamond

Mollisol - An order of soil which forms under grass in arid climates. They are dark-colored soils with relatively high cation-exchange capacity dominated by calcium.



Look for more terms next month!





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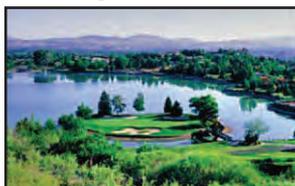


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Water for Life International

by Jon Hansen, Submitted by Tim Rasmussen



Dear Gary and Water for Life, greetings from Guatemala:

We have a beautiful day here, similar to the Pacific Northwest. Chris loves it. It's overcast, with a little rain and about 70ish. On Sunday, Edgar and Joshua showed up to work on the equipment. There are lots of things for them to do.

The radiator is off the Olson rig and it is about the ugliest one I have ever seen. It is surprising it worked as long as it did. There are lots of missing areas and many small leaks. Back home in the U.S., we would junk it, but I imagine they can make some magic here to get it to work. They always do.

All the wheels are off the truck, and brake shoes need replacing. I would also question the driver's side drum at the very least. Edgar got the two-speed rear end working (some wires were loose). When Edgar was working on "La Beasta" (the big '78 Chevy), he found the spring in the rear end for the two-speed return position was out of adjustment. He corrected it, and it is working fine. I drove it to his shop yesterday for the other items (leaky fuel pump, passenger-side dual leaking brake fluid, something else to do with the engine, and a few other minor things.) I replaced the red Ford ignition lock, so it's good.

The well at Jimmy's school is doing fine. They have run it steadily for 2 to 3 days at 30 gallons per minute (gpm) to fill the fishponds. There was very little drawdown, maybe 3 feet at the most. We will see how the next 3 months go as far as static water level.

We stopped by the gas station near the Y to San Francisco where the San Benito drilling crew was installing a well. They went to 600 feet with a 12-inch hole, 8-inch casing installed. Last Thursday, the drill operator was waiting for the test pump to show up, he thought it might make up to 300 gpm. There were two other rotaries on the San Francisco road, looks like they are drilling with mud; go to 500 to 600 feet and take all that is there.

Chris and I spent a couple of days helping paint the inside of Edgar and Beatriz's home. It was pretty dark; now it is pretty light. We have the shop fairly orderly, yet there is always more to do.

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

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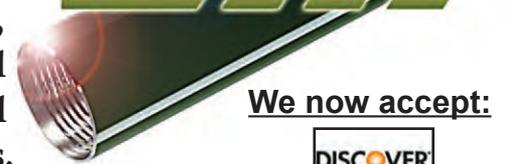
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Drilling Into Money Not Boring

by Mark E. Battersby

Dealing with Troubled Customers

There are a ways customers who go out of business without warning - or without paying the bills. While, in these cases, it's often too late to correct anything, a drilling professional's vigilant about outstanding accounts receivable and the financial status of a customer's, many losses can be averted.

It's far easier to take a proactive approach by avoiding the types of customers who usually speak trouble, staying alert to signs long-time customers are having financial problems, and taking quick action when payments are slowing down. Worried about the customer going elsewhere? Sometimes it's a good thing.

Troubled or problem customers become problems for competitors.

Obviously, things can go south quickly, so minimizing exposure to a customer or potential customer's credit troubles requires every drilling contractor to exercise "due diligence." In other words, minimize exposure to the credit trouble of others in the business, and at every step of the relationship.

Due diligence also means staying on top of paperwork. It's a too easy to fall behind on invoicing in the midst of big projects, but letting it slide for a month or two will put the drilling operation at risk. Before you know it, a customer owes a significant amount of money. To avoid this problem, establish regular routines for billing customers which reflects their preferences. Sending an invoice every two weeks might be a good strategy. If customers start taking longer than usual to pay, it's ready not to be.

While most drilling contractors are aware contracts and payment terms should always be put in writing, this is one way to protect the business if a customer runs into financial problems. Few troubled customers are likely to begin paying simply because there is a contract.

Owning a business can be a lot of fun, but there's one aspect no one enjoys: trying to collect from customers who have run short of money. Unfortunately, wringing money out of deadbeat customers has become a common issue in today's slow-growing economy. In some cases, the only option may be hiring a collection agency or going to court to collect, but many small business owners don't like to go these routes.

By monitoring customers' payment practices, credit standings, other financial indicators, and even gossip, a drilling contractor or business owner can significantly reduce potential financial headaches. After all, to stay in business means dealing with customers, warts and all.

Mark

Mark E. Battersby may be contacted via e-mail to michele@worldwidedrillingresource.com

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GRENADA MAKES PROGRESS WITH GEOTHERMAL EXPLORATION

Adapted from Information Provided by the Government of Grenada

The Geothermal Support Partnership Framework Agreement, which was signed in 2014, has recently facilitated the following efforts aimed toward the exploration and eventual use of the country's geothermal energy: the review of previous studies; the mission of taking copious geochemical, geophysical, and geological surveys; scrutiny of institutional, legislative, and regulatory

structures in regards to any potential projects; and early analysis of infrastructural capacity as far as access of equipment to any plausible exploration sites.

These are the latest steps taken to examine Grenada's geothermal suitability. In July 2015, at the Grenada Geothermal Partner's Forum, the suspected existence of a high temperature geothermal reservoir was validated north of Mount Saint Catherine. The reservoir itself is approximately 2 to 5 miles in depth, with expected temperatures ranging from 428°F to 4352°F (220°C to 2400°C) - or even higher. If this information is correct, between 15 to 20 megawatts of power could possibly be generated.

Inside the first quarter of 2016, experts from both the Japan International Cooperation Agency (JICA) and Jacobs New Zealand Limited completed three more tasks necessary to the project: the second geoscience report on the status of geothermal resources; a geothermal resources roadmap, and a preliminary civil engineering survey. They also conducted meetings with officials from the Ministries of Finance and Energy, Works, Health, and Agriculture, as well as members of the statutory organizations whose work involve environmental and social concerns relating to the geothermal process.

In April, Aoiki Issei (deputy director for JICA in Central America and the Caribbean) and his deputy, Nakayama Shun, visited Grenada and conducted meetings with environmental and social stakeholders. They also met with the permanent secretary and other senior officials within the Ministry of Finance, monitoring the development of Grenada's geothermal initiative. The exchange of information resulted in the decision to soon host a broad-based geothermal forum.

To date, the equivalent of over \$1 million U.S. dollars has been spent on this project.

Grenada's government is more than willing to accept the bilateral cooperation and technical assistance of friendly governments.

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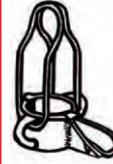
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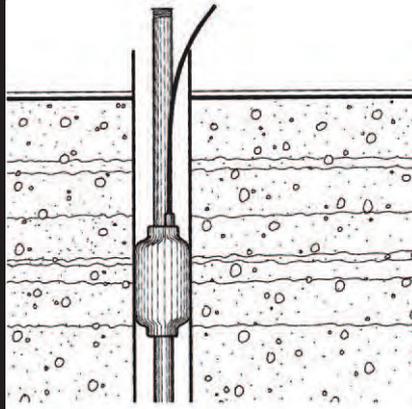
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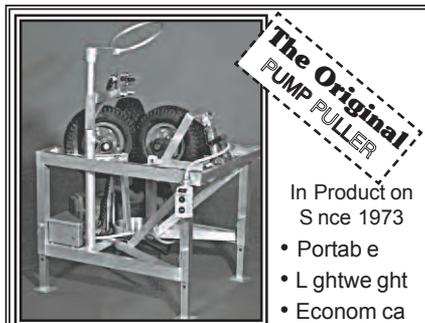
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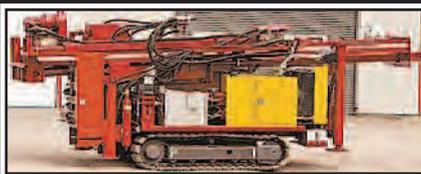
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2014 MAX-10DR dual rotation track-mounted drill rig, 2300 hrs, 16' stroke, angle package, lower drive up to 10" casing.....**\$385,630**

2010 HARDAB 7000 H-3 track-mounted drill rig, 2500 hrs, rod handling system (patented) with angle package, 12' stroke, 550' of 3.5" drill pipe...**\$196,250**

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2009 Sullair combo 900/1150, trailer-mounted, 1840 hrs.....**\$85,000**

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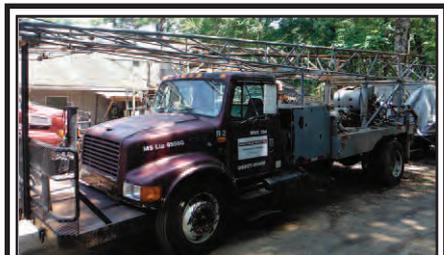
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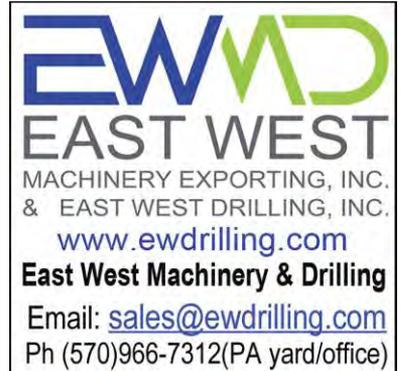
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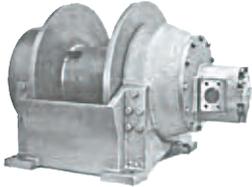
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Fire it Up
*Adapted from Information by
American Association of
Retired Persons*

What's summertime without a couple of backyard barbecues? Gas grills have become larger and more powerful. With all the power, comes the potential for flare-ups. For all of you grill masters and cuisine chiefs, here's a few tips on how to keep that "fire up" from "flaring up".

If you're cooking and notice the flames getting out of control, close the lid to not give the fire any more oxygen. To avoid a fire in the beginning, turn on the grill and turn it off in the proper order. With the lid open, open the propane tank first, then turn on the burner knobs, and hit the ignition. When you're done, turn off the propane tank, then the burner knob, says the National Fire Protection Association's Guy Colonna.

Enjoy your summer cookouts!

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