My son loves the TV show *Curious George*. He has a ritual of watching George every morning before school, reading all the George books, and even has a stuffed George that comforts him while he sleeps.

I’ve learned a lot from *Curious George*. Working in the ground water business, you need to be a little bit like George. If you don’t know something, don’t be afraid to learn about it. Like George, you’ll be glad you did.

I remember the first time I saw a mud system. It was about 10 years ago and I was fresh from the corporate world of skirts and high heels. I had never seen a mud pit and never understood the importance of proper mud mixtures and adequate equipment in sandy situations. But mud systems can save the day when sand is filling up your borehole.

When you don’t know how to use something, the best place to go is to the professionals. I interviewed several of our industry professionals for this article. Their answers to my questions were very insightful and taught me a lot about the proper use of mud. Whether you’ve been using mud systems for one year or 20 years, I hope their comments give you a little something you can take away and put to use in your drilling business.

**Manufacturers’ History in Mud**

The companies I interviewed got into the mud system business in a variety of ways.

(L Lana Straub, with a background in legal and financial aspects of small business, is the office manager of Straub Corp. in Stanton, Texas, an environmental and water well drilling firm owned and operated by her family for more than 50 years. She can be reached at Lana@StraubCorporation.com.

Jim LaPorte of Mudslayer Manufacturing was a drilling contractor for 24 years in southern California and built his first mud system out of necessity. “I had to use an earth pit my first year in business and hated it,” LaPorte recalls. “The wasted water, the mess, the wear and tear on my equipment; it was such a huge waste of time and money, so I built my first of many mud systems and never looked back.”

Tony Tibban of MudPuppy had similar beginnings.

*NGWA.org*
“Right out of high school I got a job as a driller’s helper drilling water wells,” Tibban says, “I wouldn’t call them mud systems back then; they were more like big tanks with an engine. (The first one) was built in my garage with whatever parts I had on hand.”

That was in 1984. Tibban later worked in the oil field for a few years after that and applied his oil field knowledge to water well applications. MudPuppy turns 20 next year.

LaPorte and Tibban’s real life experiences using mud have determined how they design systems today.

What are the key components of a good mud system?

According to the experts, there are three basic components that work together as a team to make a good mud system. A mud reservoir system, a mud mixing system, and a system to clean the mud before it goes back downhole. Each manufacturer told me that every part of the system is important. They also shared their opinions as to how the different parts each serve a crucial purpose in the overall mud system.

Tibban states that “the reservoir is a key component in storing the mud in a way that sand or solids do not settle to the bottom of the tank and should be self-cleaning so the operator does not need to shovel sand out at the end of the day.”

Jim Miller of Mud Technology International believes every system should have a large scalping shaker.

“It’s important to remember that the scalping shaker is the first line of defense,” Miller advises. “If the scalping shaker cannot handle material and allow mud into the system without creating a bottleneck in the flow of fluid, you just create additional work for the rest of the system.”

LaPorte agrees.

“The heart of any shaker is the shaker deck,” he says. “There are basically two types: single shaft which work fine but really do not compare to dual shaft linear motion; dual screens are better because you can recover fluids from the hydrocyclones.”

“You want all of the components (desander, desilter, pumps, etc.) sized correctly to handle the volume that you are trying to pump without sacrificing cleaning ability,” Miller adds. “A good mud system properly sized to your particular needs will reduce the amount of time and expense incurred in downtime while you are trying to rebuild your pump, swivel, packing, etc.”

Michael West, CSP, senior field sales and service representative for Baroid Industrial Drilling Products, offers this advice from the perspective of a mud manufacturing company.

• Start with a mud mix appropriate for the geology and compatible with a mud cleaning system.
• A premix tank of half the volume of the mud cleaning unit to maintain consistent mud mixes.
• The first screen must remove enough of the drilled solids to prevent overloading or plugging of the desander cones.

“A properly sized mud system should keep the sand content below 1% while drilling,” Tibban says. “The cleaner the mud, the longer pumps and other equipment last. Clean mud speeds penetration rate, keeps the wall cake clean and thin for better producing water wells, and mud products work better and more efficiently with clean mud.”
“The most popular manufactured mud system will become one that is highly portable, easy to set up, and efficient.”

LaPorte also reminds us not to forget that “portability and fast setup for a quick start” are important to make the drilling job profitable. All three mud system manufacturers I interviewed do offer portable solutions of their products.

What types of fluids are recommended for a good mud system?

Baroid Industrial Drilling Products manufactures several products specifically designed to aid in the efficiency of mud systems.

“Most bentonite drilling fluids can be used along with several polymers for filtration control,” West says. “Long chains and PHPA polymers used for clay and shale stabilization will blind the screens and should not be used. Instead, use a short chain PHPA polymer when using a mud cleaning system. Quality of the makeup water is critical to all drilling fluids.”

The fluid you use will depend on your application needs.

“A mud system doesn’t distinguish between water based, polymer, and/or oil based drilling fluids and will move any fluids within reason,” Miller advises. Don’t forget that efficiency is what you’re after.

“On average, a good working mud system will cut your production water use in half,” LaPorte says.

Tibban reminds us to do our research and try different options to make our mud systems work.

“Keep in mind the mud system’s major job is to keep the drill fluid clean,” he says. “There is no one fluid that fits all types of drilling and there is no one mud system that works with all drilling fluids.”

What is the most popular type of mud system?

While the earth pits and metal pans have been the most popular mud systems in the past, technology is changing the way that drillers use mud systems. Mudslayer Manufacturing sells the most of their “lighter, hydraulic, linear style” simply because the drillers LaPorte has met prefer hydraulic over electric. Getting the job done efficiently is important to most drillers.

Mechanized systems provide clean, efficient solutions and a reduction in manpower as your shovel man doesn’t have to work near as hard.

“The mud is cleaned and can be used for the next bore. There is no need to drain and clean between boreholes,” Tibban says.

Miller says that he believes government regulation is also changing the minds of many people.

“With the ever watchful eye on our environment, governmental regulations have imposed the necessity of the utilization of portable mud recycling systems on the drilling location. We believe that the most popular manufactured mud system will become one that is highly portable, easy to set up, and efficient,” he says.

The need for self-containment of fluids seems to be something most manufacturers agree makes their systems so popular.

What are the steps you suggest a drilling company undertake when considering the purchase of a mud system?

Mud systems are a big investment. Manufacturers have varying opinions on points that you should consider when purchasing a mud system. But they all agree that it is important for the drilling company to communicate with both the mud system designers and fluid companies prior to investing in a system.

West suggests that you “consult with the manufacturer of the mud cleaning system and your local drilling fluid representative to best match your existing equipment and drilling conditions with both the mud cleaning system and the fluid you will run.”

Questions provided by Mud Technology International to consider prior to purchasing a mud system:

- What is the size of the drilling rig?
- What is the pump output in gallons per minute?
- On average, how deep do you intend to drill?
- What is the maximum depth you plan on drilling?
- What is the general location of where in the country or world you are drilling?
- Is the mud system going to be used in a hazardous duty operation and/or environment?

Before purchasing a system, Miller advises you to “call and discuss your specific needs with the company you decide to purchase your mud system from and they can assist in providing you with the right equipment for the job.”

What information do you need prior to suggesting a mud system?

Manufacturers have varying opinions on the information they like to know prior to suggesting a mud system to their customers. Mudslayer Manufacturing likes to know the size holes a client is drilling and the type of mud pump they will be using.

“As a rule of thumb,” advises Miller, “you should look for two to three times the total volume of the borehole at total depth.”

Above is the list of questions Mud Technology asks customers prior to making recommendations.

Prior to suggesting systems or fluids, Baroid asks their customers about “existing equipment (rig, pump, etc.), size of hole to be drilled, and the geology to determine the type and size of the drill cuttings being handled.

Knowing the type of drilling operation and application is a large factor for Tibban.
“A vertical hole will have different mud properties than a horizontal bore. The horizontal bore mud will carry more solids and require a larger mud system. A geothermal loop bore will need to reuse the mud throughout the entire job, so you will need to keep the mud much cleaner so solids don’t settle in the reservoir overnight.”

What are your thoughts on the future of using mud systems to drill wells?

West feels the changing face of the water industry will likely determine the future use of mud fluids and systems. “The more wells are being drilled in the public eye, such as for public supply wells or large geothermal projects, the need to control and contain the drill cutting becomes more important,” West says. “The capability of keeping the job site clean and dry as well as increasing productivity shows the professionalism of our industry.”

La Porte agrees, saying, “If we do not clean ourselves up as an industry, the government will impose unachievable restrictions that will price us out of business. You can’t drill 20 tons of soil for geothermal heat loop wells without environmental protection equipment on site. That’s the reality we face. The trick is making money and working as clean as you can.”

Miller seconds that notion. “We all want and need to earn a living, and personally, the team at Mud Technology International feels it is important we all work together to preserve our planet for future generations.”

Mud systems help us all do just that—make a living while doing our part to protect the environment.

Tibban feels mud systems are here to stay. “I feel the future holds the requirements for cleaner jobs and less destruction of the native areas during all types of construction,” he says. “This means mud systems will be required widely throughout drilling operations.”

Mud systems are complex and using them can bring a whole new level to your drilling expertise. When considering whether to purchase a mud system, do your homework.

“I advise my customers to buy the size of machine that covers the meat and potato work—it’s a big investment, so look at all the doors it opens,” LaPorte says. “If mud drilling is new to you, research is the most important thing. Make sure all your questions get answered, and get the field support to help you be successful.”

Tooling Up

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