

American Augers MPR 6000



Fluids Control Has Evolved To Match HDD Market Needs

by Jeff Griffin, Senior Editor

Properly-used drilling fluids are a key element in the success of horizontal directional drilling (HDD) projects. To maximize fluid benefits, it is necessary to properly mix additives suited to soil conditions and maintain flow during operations.

Fluid also is a significant drilling expense, and cleaning and recirculating can greatly reduce volumes of fluids consumed, especially on projects to install long runs of large-diameter pipes.

Although often not receiving the attention of drill rigs, fluid cleaning and recirculation systems available today incorporate significant advances over early models used for HDD applications, many of them using technology developed for vertical drilling in the oil and gas industries.

And while primarily thought of as a large-rig necessity, utility contractors are beginning to recognize the benefits of reusing fluids and applying them to projects using medium-size HDD units.

Representatives of four key fluid system suppliers discussed the role of fluid reuse in the HDD industry and features offered by current models.

American Augers, Dan Sharpe, vice president of marketing and sales: Large pipe installations could not be done without fluid recirculation systems – the jobs

simply would not be economically viable nor would the local governments allow thousands of gallons of drilling fluid to run down their streets and creeks.

After that, the biggest benefit of using fluid cleaning is cost – it simply saves you money because drilling fluid is reused instead of pumping it out once and making a new batch.

HDD mud systems are routinely used on oil and gas, and large pipeline HDD jobs, which require larger pumps and much greater amounts of drilling fluid. When using such large volumes of drilling fluid, it is best to use mix/reclaim fluid systems. It would cost a great deal of time and money to have trucks haul away the fluids after a single use, and the savings go directly to the contractors bottom line.

American Augers currently has two mud system models: the 4,000-gallon MCM 4000 that mixes and cleans drilling fluids and the trailer-mounted MPR 6000, which not only mixes and cleans, but also has an on-board mud pump rated at 500 gpm.

We do not make smaller than these because contractors have not been willing to spend the time to recycle small amounts of drilling fluids. However, we are finding more and more contractors using fluid systems for the cost savings and also it is not as easy to find places to dump your old fluids. So, like other industries, recycling helps reduce costs and adds to the bottom line.

M-I Swaco, Gary Matula, technical and marketing manager, HDD Mining and



Meerkat PT shaker

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Waterwell Group: The use of solids control equipment in HDD applications is most advantageous where the fluid will be continuously recycled over the life of the job. This is especially important in large-diameter pipeline crossings where drilling will take some time. Even operators of smaller HDD rigs can take advantage of proper fluid recycling.

We now offer the new Meerkat PT shaker, designed to reduce drilling waste, minimize screen replacement costs, allow for a small job site footprint and provide easy rig-up and rig-down.

It is widely accepted within the HDD industry that the more solids-laden the drilling fluid, the slower the penetration rate. A slower penetration rate means the cost-per-foot is higher, which has a negative impact on the job's profitability. A dirty fluid means a fluid where the drilled solids that are being incorporated by the drilling process are not properly managed.

A dirty fluid also leads to premature equipment failure, higher fluid maintenance costs and higher disposal costs. In addition, a dirty fluid can lead to higher than anticipated bore pressures during drilling because of the higher fluid viscosity. This



can easily lead to undesirable frac-outs. Utilizing the proper solids control equipment to keep the drilled solids from building up in the fluid will lead to reduced overall job costs.

Our group has taken advantage of new solids control equipment designed for the company's energy drilling business and applied it to HDD applications. New Meerkat PT and Mongoose PT shakers are part of the family of solids processing equipment that includes mud cleaners, mixing equipment and custom-designed equipment tailored to

specific customer requirements. Advances introduced include new long-lasting screens that can be replaced within minutes using a patented lock-down system and new pre-tensioned screens. The shaker can be easily installed on top of typical rig mud tanks and transported as a single unit.

Mud Technology International, John I. Miller, chief executive officer: In any HDD project – large or small – solids control is the main component in achieving maximum success.

The basic concept of solids control has

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been the same for many years. Bentonite drilling fluid has been used in drilling applications for more than 80 years after it was discovered that utilizing bentonite (or similar additives) produced several benefits. It could promote hole stability in poorly consolidated formations, “viscosify” water and clean the bore hole, lubricate the bore hole during drilling, and hold solids in suspension during down time while making connections or pipe trips in and out of the hole. There are components that can enhance the cleaning capacity based upon the drilling application and or material installed.

Throughout the years, we have found that the HDD drilling crews can drill holes as long as the oil field holes are deep but they may be larger in diameter. While standard oil field drilling uses annular velocity (speed the fluid travels outside the drill pipe and inside the well bore) to help lift the solids, the HDD drilling crews have to substantially increase the viscosity over that in the oil field to achieve the same carrying capacity due to the larger diameter holes being drilled horizontally. We strive to size a cleaning system to 1½ to 2 times pump output capacity.



Mud-Tech MCT 500

Large-volume bore holes in environmentally-sensitive areas or anywhere continuous high volume pump rates are required, poor soil conditions or areas where available water sources are scarce could all prohibit or prevent drilling without a drilling fluid recycler.

While the HDD industry requires larger cleaning capacity, it may not require the volume needed in the oil field. This equates to highly-efficient mobile equipment that can be maneuvered to fit in tight or cramped drilling locations.

Recycling drilling fluid is not only cost ef-

efficient but is sound in a world that should be cognizant of the fragile environment. In the past, when a contractor wanted to save money by reusing the drilling fluid or haul-off was cost prohibitive (long travel routes for disposal, etc.), there were not many options available. With advances in technology the recycling of drill fluids is the best choice for saving time, money and the environment. But it is important to remember that even the best drilling mud available cannot do the job alone; it must be backed by good solids control equipment and a knowledgeable crew working together.

We offer the HDD industry a large range of drill fluid mixing, pumping and recycling systems. These can be built as a combination of the three or as independent units. The units range in size with cleaning capacities from 100 gpm to 2,000 gpm and can be customized to meet each customer's specific needs. Any of the equipment is available skid - or trailer mounted and built with or without a triplex pressure pump.

We are finding that contractors are using recycling systems on a large range of projects including the smaller drill rig market.

As technology of drilling fluids, recycling systems and HDD equipment improves, the overall cost of drilling is coming down even as overall drilling costs go up. Because of these improvements, jobs are completed today that could not be attempted in the not-so-distant past.

Tri-Flo International, John Cope, HDD sales: The advantages of a drilling fluid cleaning system may not be that obvious when drilling small holes or loose sands and clay. It will, however, become apparent in a large pull back or rock bore with mud motors. Once your fluid usage goes to 200 gpm it becomes almost impossible to keep up with that flow without recycling fluids.

The HDD solids control equipment market is very competitive with manufacturers arranging their products in a variety of different configurations from one shaker for scalping incoming fluid to one shaker for de-sanding hydro-cyclones and final cleaning process with a bank of de-silting hydro-cyclones over a shaker.

Some manufacturers use one shaker, made with two panels, one above the other to perform two different cleaning processes at the same time, allowing equipment to have a smaller footprint. When it comes to shaker design, there are major differences in type of motion – linear and elliptical. Each has its benefits – linear has high through put and elliptical produces drier cuttings.

For HDD drilling compared to vertical drilling, the HDD driller must make up the lack of annular velocity with added gel strength by high viscosity or adding of polymers, both of which can create a loss of efficiency and make it hard to separate solids. Vertical drilling for energy wells also does

not require pullback of 48-inch reamers.

We offer cleaning capabilities ranging from 75 gpm up to 1,000 gpm with holding tank capacities from 400 to 12,000 gallons. The goal of most solids control equipment companies is to provide equipment for at least two of the drills built by the various manufacturers. The small 75 gpm and 400 gallon capacity models have a very narrow target.

FOR MORE INFORMATION:

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