



# wrapped UP

After winding its way into the conventional shallow gas business, coiled-tubing drilling has also wrapped up a share of the rapidly growing Canadian coalbed methane (CBM) market.

Instead of joints of pipe that have to be screwed together, CT drilling rigs use one continuous string of small-diameter “drillpipe” wrapped around a drum. So tripping in and out of the hole is much faster and the small rigs can quickly move between drilling sites.

Strictly from a drilling standpoint, there may be no inherent difference between CBM and conventional gas. But with the higher well densities, environmental and landowner concerns can play a bigger role.

Apache Corporation, Canada’s top coalbed methane producer at 60 mmcf a day in the second quarter, expects to drill roughly 350

CBM wells this year in central and southern Alberta. About 80-90% of those will be drilled with coiled-tubing rigs, estimates Ralph Herbert, coalbed methane manager for Apache’s Canadian subsidiary, Apache Canada Ltd.

Why coiled tubing? Minimal disturbance, says Herbert. Coil rigs usually don’t require site preparation for a drilling location. They can just go in and start drilling, even if the terrain is on a slight grade. Traditionally, a tractor would have to be brought in to level such sites. Eliminating site preparation saves time and money, and leaving the terrain in its original condition is always popular with landowners. “When we start downspacing, as we are in CBM, to either four to eight wells per section, you really have to be conscious of what your environmental effects are,” Herbert says.

Apache Canada’s primary contractor for CBM drilling with coiled tubing is Trailblazer Drilling Corp. One feature Apache likes is the rigs’ dual capability — the ability to drill with either coiled tubing or jointed pipe. This means the coil rigs can drill surface hole, retrieve core samples, and fish for tools that are lost or stuck downhole.

While day rates for coiled-tubing drilling are typically higher than for conventional rigs, this is offset by the faster coiled-tubing drilling rates and mobilization times, Herbert says. And at depths of less than 1 000 metres, he notes, mobilization time ends up being a bigger factor than the actual drilling rate.

Spearheading the use of coiled-tubing in CBM drilling is Medicine Hat, Alberta-based Trailblazer. The company, a division of Savanna Energy Services Corp., bills itself as the world’s largest coiled-tubing driller. By mid-September, it owned 27 rigs with four others scheduled for delivery by year’s end. The company, which builds its own equipment, plans to

add 10 more rigs to its fleet next year. Trailblazer hired roughly 150 employees last year and a similar number this year for a total workforce of more than 400.

"I don't think anybody has grown as fast as we have," says Trailblazer general manager Gene Carriere, a pioneer in the use of coiled tubing for conventional drilling in Canada.

Helping to drive the company's growth is the emerging Canadian coalbed methane industry, which didn't exist at the start of this decade. About two-thirds of Trailblazer's rigs now drill for CBM while the rest chase conventional gas, says Carriere. He estimates his rigs, which started drilling for coalbed methane about 2½ years ago, have probably punched out about 800 CBM wells.

Carriere says CBM producers like having the option of drilling with jointed pipe, even though the Trailblazer rigs spend 95% of their time drilling with coil. "If you run into problems of some kind, you can always in a matter of minutes switch back to drillpipe," he says. "They're getting two rigs in one, basically."

EnCana Corporation, which had CBM production of 46 mmcf a day in the second quarter, uses two Trailblazer rigs for CBM drilling. EnCana expects to drill about 240 CBM wells this year in the 400- to 1 000-metre depth range. In that market, coiled tubing is "much more cost effective" than rotary drilling and the rigs are extremely fast — both in drilling and mobilization, says Ken Rae, drilling co-ordinator for EnCana's Parkland Central region.

Like several producers using coiled-tubing drilling, EnCana usually first sends in a pre-set rig to drill the surface hole and set the surface pipe. The idea is to keep the coiled-tubing rigs drilling continuously. Use of the pre-set rigs ensures the fast coil rigs spend the maximum time drilling and are exposed to fewer delays such as waiting on cement.

However, it is still an advantage for the coil rigs to be able to drill conventional, Rae says. In situations where jointed pipe is needed, the coil rigs can quickly switch over to conventional rotary drilling.

EOG Resources Inc. expects to drill about 150 CBM wells in Canada this year — about 80% of them with coil, says Lane Dunham, EOG's Canadian drilling manager.

Overall, Dunham estimates the coil rigs are about twice as fast as conventional rigs, with penetration rates of about 150-175 metres an hour and a tripping speed (in and out of the hole) of about 700 metres an hour. The shallow CBM wells take four to six hours to drill.



## COILED TUBING DRILLING CAPTURES A CHUNK OF THE CBM MARKET BY PAT ROCHE

But EOG keeps some fast, highly automated rotary rigs on hand for tasks such as logging and wireline retrievable coring. While the coil rigs are often used to retrieve core samples as well, highly automated rotary rigs are faster because they can use wireline to retrieve the samples, says Dunham. Coal cores reveal gas content, but it's crucial to get the samples to the surface as quickly as possible because the coal quickly degasses as it depressurizes.

But as far as drilling technology goes, Dunham says there is absolutely no difference between drilling for coalbed methane and for conventional shallow gas. "All you're doing is drilling a hole in the ground and wherever you can get gas from, you'll take it," he says. "We're keeping our density of the fluid as low as possible and keeping the drilling fluid as clean as possible so you don't get any invasion or contamination. And that's what you do for any good producing reservoir."

However, not all CBM producers are convinced coil tubing is inherently better than rotary drilling.

"We haven't seen any significant cost or time saving," says Mike Gatens, chairman and chief executive of MGV Energy Inc., which is Canada's third-largest CBM producer with output of 36 mmcf a day in the second quarter. "We do most of our drilling with shallow-gas singles," he says, but adds the company also uses coiled-tubing drilling rigs. "I don't think we see a tremendous advantage one way or the other."

On the shallow, dry Horseshoe Canyon coals — where MGV has done most of its work to date — the company was recently using one coiled-tubing drilling rig, one highly automated rotary rig and another slightly older conventional-single rotary rig. MGV typically pre-sets its surface pipe and the drilling rig drills the main hole, usually in less than a day. "We're moving every morning. So we want something that's pretty small, can drill pretty quickly and also is pretty mobile," says Joe Farley, MGV's drilling and completions supervisor. "It is fairly akin to shallow gas."

Canada's two largest drillers have designed

coiled-tubing rigs aimed specifically at the CBM market. Ensign Resource Service Group Inc. commercially launched its ADR-1000-CT rig in May following field testing. Precision's new CBM rig is under construction. In a conference call early this year, Hank Swartout, Precision's chairman and president, said the company was designing a new rig "which we think will be the most advanced CBM rig the world has seen" to date. The rig, which is being built for a specific customer, is due out before year's end. Precision was unwilling to discuss the design in detail until the rig has been built and field tested.

It isn't surprising that coiled-tubing rigs would be used for coalbed methane drilling in Canada, given the technology's success in conventional shallow-gas drilling in Alberta. So far, though, it's a Canadian success story that hasn't been copied south of the border. In a June report on coiled tubing, the U.S. Department of Energy suggests one of the reasons is "culture" — "Canadians appear to be somewhat more open-minded when it comes to adopting new technology."

Any obstacles to coiled tubing drilling in the U.S. "certainly could be overcome," the report said, suggesting the failure of coiled-tubing drilling to catch on in the Lower 48 states has more to do with "chicken-and-egg issues ... than geology, economics or legal/environmental issues."

The DOE report said the world's three largest service companies see the shallow-gas drilling market as limited in scope and they prefer to compete globally in such high-margin applications as high-pressure well intervention, underbalanced multilateral drilling and extra-long well remediation. The report suggested service companies that don't already have an interest in coiled-tubing drilling "are more or less sitting on the sidelines, waiting for the market to develop, rather than making the investment to push it along." For Canadian coiled-tubing firms, this can only be good news as Canada's mushrooming CBM industry is added to an already booming shallow-gas market. **ntm**