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Why this longtime energy inventor believes he can hugely increase recovery rates

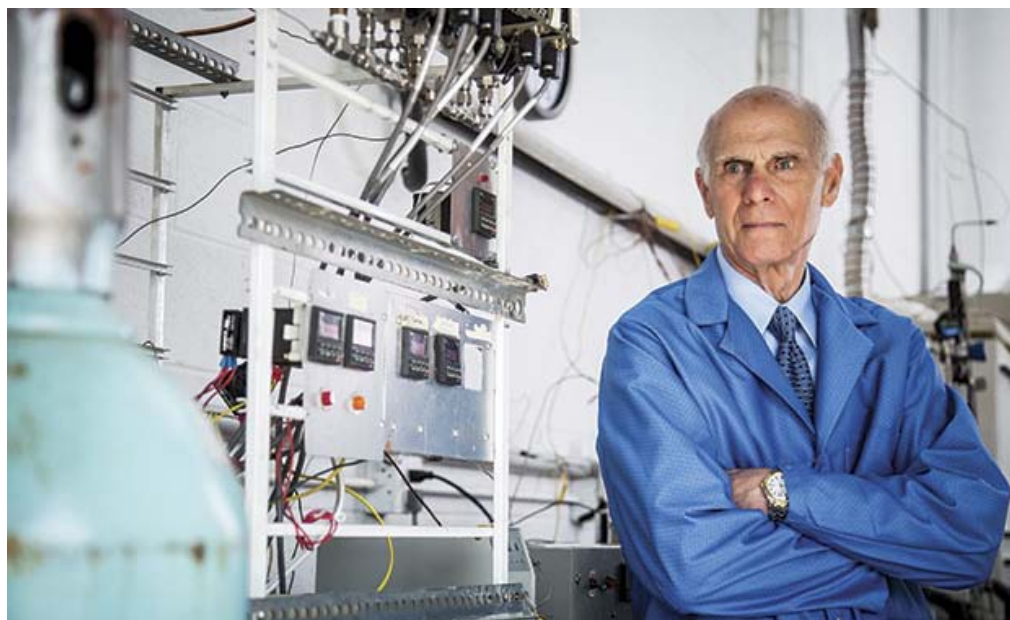
How Conrad Ayasse is continuing to push the envelope when it comes to enhanced oil recovery

BY GEOFFREY MORGAN | [follow Geoffrey Morgan on Twitter](#)

September 19, 2014

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Conrad Ayasse finds inventive solutions to complex oil and gas problems in his southeast Calgary laboratory
Photograph Chris Wedman

Unfortunately for Conrad Ayasse, the name “enhanced oil recovery” was already taken. That’s one reason why he’s calling his company’s technique to stimulate production from rapidly declining tight oil wells “improved oil recovery.”

In the end, “improved” may be a better word for the well stimulation solution that Ayasse has invented and is now, through his company IOR Canada Ltd., trying to license to well completions providers. Like enhanced

“I’m using fractures as wellbores. It’s this tool that allows me to isolate the fractures.”

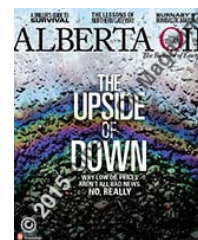
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oil recovery, IOR Canada's method holds

promise for energy companies operating in plays like the Bakken, where oil flow rates from horizontal, multi-fracked wells can decline by 40 per cent after their first year of production. As a result, operators in those plays rely on secondary recovery methods like CO2 flooding, water flooding and fire flooding to mitigate such steep production decline rates.

Ayasse describes his improved oil recovery system as "fracture flooding" and adds that it does not require a producing well to be taken off production or re-fracked. And unlike some cyclic EOR techniques, Ayasse's process doesn't require a well to alternate between injecting cycles and production cycles. "It's a continuous process," he says. In the model he has developed, IOR Canada can achieve a 40 per cent oil recovery factor in existing multi-fractured wells partly because his fracture flooding technique stimulates a larger portion of the oil reservoir than some other EOR techniques.

To demonstrate how his process works, Ayasse sketches out a horizontal wellbore on the wall of his research laboratory in a southeast Calgary industrial park. He then draws fractures along the wellbore, together with packers on either side of each fracture. "I'm using fractures as wellbores," he says, sketching in two tubes that run through each of the packers in his drawing. Pointing to the combination of tubes and packers, he says, "It's this tool that allows me to isolate the fractures."

By using packers to isolate individual fractures – starting with the frack farthest out at the toe of the wellbore – Ayasse says that he can flood that specific fracture with a gaseous stimulant, like carbon dioxide, which in turns pressurizes the oil in the reservoir to flow into the next fracture. As a result, he can turn half of the fractures in the well into injection points for well stimulants and put the other half of the fractures on production. Pointing at the two tubes running the length of the wellbore sketched in erasable ink on his wall, he says one of the tubes in the wellbore is used to inject stimulants in alternating fractures while the other is used to collect the pressurized oil now flowing out of the adjacent fractures.

The mechanics of the system look simple enough. Pump gas into one fracked hole in the rock in order to pressurize the flow of oil out through the next hole. Then repeat the process over and over all the way down the wellbore. "It's not rocket science," Ayasse says. But it's patented.

Ayasse holds a Ph.D. in chemistry and has 29 patents to his name. He spent 13 years with Dow Chemical Canada Ltd. and 14 years with the Petroleum Recovery Institute which has since become part of Alberta Innovates – Energy and Environment Solutions. The improved oil recovery invention is just another feather in his cap. In 10 years with Petrobank Energy and Resources Corp., he assisted in the development of the toe-to-heel-air-injection (THAI) in situ oil sands combustion process, which has been a proven success in the lab but that the company, which recently merged with Touchstone Exploration Inc., has struggled to commercialize.

To date, Ayasse has taken his invention to a number of privately held well completions companies based in Calgary but has yet to strike a licensing agreement with a pressure pumper. He says the simplicity of the system and the fact that all the equipment required to make it work is readily available would make fracture flooding relatively easy and cheap to implement. Still, he's waiting.

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