

Tiny bubbles make big wave in oilpatch

Waste-water treatment headed for change

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EDMONTON - Farmer, part-time oilman and inventor Jim Bowhay hopes his tiny bubbles will soon change the way the oilpatch handles its waste water.

Its equipment is now undergoing field trials west of Edmonton and attracting a steady stream of investors, oil-industry executives and government officials. Total Fluid Solutions, part of Wescorp Energy, thinks it has a winner.

In typical oil and gas wells, at least half of what comes up with the hydrocarbon is brine. Once the oil or gas is separated out, there are still several hundred parts per million of petroleum left in the brine after conventional separation. Companies reinject the waste water, usually into a different reservoir or cavity.

But the residual hydrocarbons gum things up. Within weeks, the reinjection well is plugged, and is in need of servicing to reopen the reservoir. And that can cost \$50,000.

"It's kind of like pouring grease down your sink. It eventually plugs up your drain," said Bowhay.

The tiny bubbles clean out the residual water to just a few parts per million. The cleaner water can be injected to improve pressures in the reservoir without gumming up the works as quickly.

"Our patented process has shown it can reduce operating costs for the company," said Wescorp vice-president Dave LeMoine. "We can get them down to five fracs (well servicing events) a year from 10, so right there is a big saving."

Also, about 40 barrels of oil can be recovered from a 2,000-barrel-per-day facility.

But it all starts with those tiny bubbles, which attach to the oil droplets in the water. That breaks the oil water interface, allowing the oil to be skimmed off.

A bit of an inventor, Bowhay says he became fascinated with the way sand and water separated in various shapes of vessels with air added.

"We used probably a hundred pop bottles, and glue, and straws. We tried different combinations until we thought we had something."

He says his children got a kick out of helping and "probably learned something about science along the way."

Partner Dermot McCan did some preliminary work with a major oil company, using hydrogen peroxide, but the project was abandoned. Later, McCan and Bowhay purchased a novel aerator from a U.S. inventor.



CREDIT: Larry Wong, The Journal

Jim Bowhay, a consultant with Total Fluid Solutions Inc., collects a sample of water at an oil-water processing facility owned by Wescorp Energy Inc. near Wabamun Lake.

The unique design was able to create the kind of tiny bubbles required, and worked when installed in their vessels. They now use nitrogen as the inert gas to create the bubbles.

Wescorp president Douglas Biles said it took two years for him to convince the two inventors to sell their work and get it into the oilpatch.

"It looked good to us. For every 10 ideas that we examine perhaps only two really work out. But that's what I do," he said.

The pilot plant has been attached to the Energy Opportunity Growth (EOG) battery near Lake Wabamun. There are about 120 oil and gas wells over a 16-kilometre by 10-km area, all hooked into the facility. Some of the wells have been producing for 40 years.

"I can take our system down and move it in two hours on a flatbed. We can truck it anywhere," says Bowhay.

Its location near Edmonton has been handy for viewing, but now it is headed east to either the Lloydminster area or further south in Saskatchewan to handle heavier oil.

Wescorp officials say once the testing and engineering studies are complete, the units will be able to be constructed in large quantities and leased to oil companies for about \$1,500 a day.

Much larger units are on the horizon. And Westcorp plans to target the SAGD industry, which uses large volumes of water to make steam to extract oil from deep deposits.

"I think this process has a great future. Alberta produces 500,000 barrels a day of conventional oil, and that means 500,000 barrels a day of water which has to be cleaned and reinjected. And that is not counting the oilsands or other unconventional resources," said LeMoine.

Bowhay works as an adviser for Wescorp and is hands-on at the pilot plant. But he is still a farmer.

And he has sold the aerator system only to Wescorp for the oil and gas industry. "I think it would do well on the farm. I could see it as an improved hog manure spreader," he said.

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