Photo: Aqua-Pure Ventures Inc.

itinerant solution

The NOMAD water treatment system, which uses mechanical vapour recompression evaporation technology, is contained on three skid-mounted components: a pretreatment module, an evaporator and a compressor.

Right As Rain

CALGARY-BASED COMPANY FINDS NICHE CLEANING SHALE GAS OPERATIONS' WATER

By Lynda Harrison

ANYONE IN THE oil and gas industry knows water is a huge issue for many operators, either because they produce too much and have trouble disposing of it amid ever-tightening laws, or because it's scarce and so they need to use wisely what they have available.

Often that means they have to use brackish groundwater containing high levels of salt or other solids that must be removed before it can be reused or safely discharged to streams.

A Calgary-based company, Aqua-Pure Ventures Inc., says it has the solution for dealing with flowback and produced water from shale gas operations. Its NOMAD 2000 mobile oilfield evaporators can recycle waste water for sale, re-use or environmental discharge.

Fountain Quail Water Management, LLC, a wholly owned Fort Worth, Texas-based subsidiary of Aqua-Pure, is seeing growing demand in Pennsylvania, where last year the state government enacted stringent regulations regarding discharges.

In June 2010, Fountain Quail installed its NOMAD evaporators at the Williamsport, Pennsylvania facility of its partner, Eureka Resources LLC. Now users such as Range Resources Corporation, Exxon Mobil Corporation subsidiary XTO Energy Inc. and Chesapeake Energy Corporation truck their water to the plant, saving them a 120-mile trip to the closest alternative.

Dan Ertel, president of Eureka, which is leasing the equipment, says the evaporators are about 10–20 per cent more efficient than competitors.

Fountain Quail says the pure distilled water from the Marcellus Shale waste water it receives has total dissolved solids measuring well below 150 parts per million, and contains only trace chlorides.

The 100-year-old technology was originally intended to concentrate things like orange juice and to clean up nasty water that leaches out of landfills, says Richard Magnus, chairman of Aqua-Pure. Aqua-Pure made the equipment more efficient and patented the process.

Magnus says the company's president, Harold Lauman, found the technology about 18 years ago and tried for five or six years to sell it but was unsuccessful. Then about a dozen years ago he met up with the founding partner of Colt Engineering, Jacob Halldorson, whose expertise was in the oilsands. Halldorson revamped the technology for the oilfield, making it more rugged and portable, and joined Aqua-Pure as its chief executive officer 10 years ago.

There are now nine NOMADs operating—six in Texas and the three in Pennsylvania—none of them at oilsands projects. There will soon be two in the Fayetteville Shale play of Arkansas. Two more are coming out of the shop soon and the company is looking for a strategic partner to use them.

Salty water is certainly not limited to shale plays, but that is the niche Aqua-Pure has found, says Magnus.

"We've now cleaned 14 million barrels of flowback and produced water for Devon Energy Corporation in the Barnett [Shale play in Texas] alone," he says. "That's about 600 million gallons of water that would otherwise have been disposed of down a deep well, never to come back into the hydrological cycle. We use that water for the next frac, wherever that might be. Aqua-Pure is the only company that has cleaned that volume of water."

Aqua-Pure's NOMAD 2000 mobile oilfield evaporators use mechanical vapour recompression (MVR) evaporation. Here's how it works: the feedwater is boiled to produce steam, leaving behind all dissolved solid contaminants. The steam is then condensed into pure distilled water. It takes only one-fortieth of the energy a boiler requires.

And the water it produces is cleaner than rain, says Magnus.

The NOMADs' three skid-mounted components (a pre-treatment module, an evaporator and a compressor) are designed for truck transport. "We can pick them up and move them in nothing flat," he says. More precisely, an entire NOMAD site can be moved in a week, he later adds.

They are also easily cleaned. "It's a few bolts [to unscrew] and one guy in there for eight hours with a power washer and we've got a fully clean piece of equipment and we're right back in operation putting water out the other end—because we don't get paid if there's no water getting cleaned."

Powered by electricity or natural gas, the units use 625 horsepower or 466 kilowatts and have a feed capacity of 2,500 barrels of water per day to produce 2,000 barrels per day of distilled water. The units stand about 13 feet high and the total system footprint is 2,500 square feet.

Its power efficiency, mobility and easy cleaning make Aqua-Pure a low-cost operator, he says, however he could not provide actual costs as each situation varies depending on the water to be cleaned and equipment needed.

The recent low price for natural gas won't last forever, so Aqua-Pure's prospects for the future are not dim, Magnus insists. "[If] it gets over $6, the activity will go crazy again and it could do that this year quite easily." ■