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# 'Ice that burns' could spark revolution in frack water recycling



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Researchers have found a new method to recycling frack water that could revolutionize the industry because it's more energy efficient. This site in Wise County recycles frack and produced water from nearby Barnett Shale Wells.

Scientists have found a new way to recycle frack water using gas hydrate, a crystallized gas that's more commonly called fire ice because it burns.

By now we all know that hydraulic fracturing uses millions of gallons of water and only some of that comes back to the surface. In most cases the water that is recovered is dumped into a disposal well deep below the ground where it's gone forever.

Some companies are recycling the water, such as Roanoke-based Fountain Quail Water Management. It's especially critical in areas such as [Permian Basin in West Texas where water is at a premium](#).

I toured a facility in Wise County where truckers bring [frack water and produced water from nearby Barnett Shale wells to be recycled](#). Truckers also take the fresh water away to use in the next well.

First, the water is flocculated, or "flocked" with chemicals to make the mud and other solids clump together so they can be filtered out. The second part is called thermal distillation and it involves boiling the water to separate out the brine and salt, returning it back to fresh water.

"We always look to keep things simple and the process that ours is based on is 100 years old," said [Brent Halldorson](#), COO of Fountain Quail. "If someone has found a new idea, I'm anxious to look into it."

The downside to the traditional method is that heating the water is energy intensive, according to the American Chemical Society.

Fountain Quail just uses natural gas from a nearby compressor station to power its on-site equipment.

But researchers have found another way to desalinate that uses gas hydrates, which break down saltwater and leave fresh water. Historically, the problem has been that these gas hydrates have to be kept at a chilly 28 degrees Fahrenheit, which is cost prohibitive, according to ACS.

[Researchers Yongkoo Seo](#) and Jong-Ho Cha have developed a new gas that includes water, carbon dioxide and cyclopentane and cyclohexane that removed 90 percent of salt and, in the biggest breakthrough, it does it at room temperature. It's a type of "ice that burns" that's similar to the naturally occurring methane clathrate that's forms under pressure deep under the ocean. The crystallized gas burns when it's pulled out of water and comes in contact with oxygen.

The process is still in the laboratory stage but has the potential to make the recycling process more energy efficient, according to ACS.