



Photo submitted by AWWT Inc.

The electrocoagulation operation cleans water at a dam in Colorado. AWWT Inc. is currently planning to use the method as a chemical-free alternative to cleaning flowback water from hydraulic fracturing.

## N.Y. company explores using electricity to clean natural gas flowback water

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Throughout the entire recent history of the natural gas industry's presence in the Marcellus Shale, water has been the number one environmental concern. The process of hydraulic fracturing, which is the

injection of fluid, primarily made of water and sand with chemical additives, fractures the shale deep below the ground surface to release gas and has been at the center of environmental concern since the gas boom started.

A large part of that concern is the fluid that comes back up along with the gas,

known as flowback water. Natural gas companies have made extensive strides to relieve these concerns, often by cleaning the flowback and recycling it for reuse in future fracturing operations. However, this method also often requires chemical cleaning agents.

It is this area that Advanced Waste and Water Technologies Inc. (AWWT), is looking to change.

AWWT is a company based in New York that specializes in chemical and liquid removal and waste and water treatment and disposal services. The company currently has five patents and two others pending on technology known as "electrocoagulation," which it plans to use to treat flowback water from natural gas wells in the Marcellus Shale.

"Basically, electrocoagulation consists of sending an electrical current via iron and aluminum electrodes into the wastewater, which makes the wastewater more stable," Director Joseph Ingrassia said. "The resulting hydrophobia discharges non-water molecules from water molecules. Thus, any organic material in the water rises to the surface, and any heavier material sinks to the bottom. How extensively the water is treated is based upon specific water treatment requirements, and we make sure to get samples from the pad to establish baseline water data.

"This is a great environmental solution to treating wastewater," he continued. "No chemicals are needed in this process and there are no discharge problems."

Another advantage of the electrocoagulation system is its mobility, as it can be set up on the well pad.

"This means less truck traffic to outside water treatment facilities and thus less risk outside of the pad," Ingrassia said.

"It can operate in very rural environments and it can fit on a 40-foot trailer, and the entire operation can take up about a quarter of an acre." The operation takes approximately five days to move from pad to pad.

Safety is also a major consideration of AWWT.

"The system is very safety-conscious," Ingrassia said. "Everything is grounded and we employ catwalks and pulley systems to ensure safety and it all meets OSHA requirements."

While AWWT is looking into the hydraulic fracturing area for electrocoagulation, Ingrassia noted that the system can be applied to a number of other industries.

"This process can be used in municipal waste, agriculture, paper mills, baking, removing oil from water and more," he said. "With the right combination of iron and aluminum, it can be used on a wide application."

Being a New York-based company, AWWT is also optimistic that it can make a significant impact in its home state should New York allow hydraulic fracturing, which has been an area of huge environmental concern for the state.

"We believe that the closed-loop system is the best way to go," Ingrassia said. "No chemicals are added and it makes the cleaning process easier. It's already been used in Wyoming, Colorado and Texas and we want to work it into the Marcellus region. We believe it could be a leading technology in New York as a key tool to make hydraulic fracturing safer."

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