

Acid mine drainage: Could it be used for fracking?

Daniel Moore, Power Source Post-Gazette, 11-04-14

CLINTON TOWNSHIP — From the road, it looks like any other waste water treatment plant tucked into a remote hillside in southeastern Butler County.

But a closer look reveals it's bringing in not sewage but bright-orange groundwater from an abandoned coal mine nearby. With fracking as an impetus, it could be the next step in solving one of the state's biggest contamination problems.

The treatment plant, which formally kicked off operations last week in Clinton Township near Sarver, collects contaminated drainage from Fawn Mine Number 91, a defunct mine now owned by ArcelorMittal Pristine Resources, Inc. It removes the iron and sulfate and churns out water clean enough to be used for industrial purposes, said Carolyn Kotsol, CEO of Winner Water Services, Inc.

Ms. Kotsol oversees the joint venture of Winner Global, LLC, a Sharon-based company that develops technology for energy markets, and Battelle Memorial Institute, a research and development giant based in Columbus, Ohio.

Treating the mine water, known commonly as acid mine drainage, has been weighed for years as a way to both clean up the thousands of miles of polluted streams statewide and to help supply natural gas drillers with the millions of gallons of water necessary to frack just one well.

The plant marks a step toward commercializing the recycled water and attracting drillers by lessening legal complications related to using tainted water. It has the backing of the National Energy Technology Laboratory, a research arm of the Department of Energy, which has invested \$900,000 and will monitor the results for one year.

To cover Winner Water's cost share with the DOE, the state Department of Community and Economic Development has given the project \$495,000 of Act 13 funds earmarked for acid mine drainage cleanup. The state has estimated more than 5,000 miles of inland waterways are contaminated by mining activities.

The DOE wants the plant to demonstrate the technology can clean the water to a level that drillers could use while keeping operating costs down, Ms. Kotsol said.

"We're trying to make this commercially viable," she said.

Using new technology cleans the drainage faster, the facility has a capacity to treat 100 gallons of mine water every minute. Pumps pull the contaminated water from the ground and into a small shed, where a humming aerator removes iron content. The water then travels through green flexible hoses into 500-gallon drums that separate the sulfate and other metals by mixing in a specially developed hydrocarbon blend.

The cleaned water fills a white tank near the aerator, where it can be shipped by truck or pipeline to a drilling site.

This oily blend — and the mixing technique that causes an immediate chemical reaction — is the heart of its “HydroFlex” technology, Ms. Kotsol said. It operates more efficiently than other separation processes that use membranes or heating. The system’s efficiency also lowers the cost of a treated unit of water when compared to alternative membrane technologies, she said.

Department of Community and Economic Development Secretary Alan Walker said the benefits are three-fold: The contamination is cleaned up; the residual barium sulfate could be sold to be used in paints and drilling fluid, and drillers will have a source of water without turning to local streams and rivers. One shale well requires about 4 million gallons of water to frack.

“This project is probably a win-win-win-situation,” Mr. Walker said. “We have these legacy problems, and anything we can do to clean up our acid mine drainage is good.”

For drilling companies, the issue has been legally complicated. Fears that they could be liable for further pollution under the state’s Clean Streams Law have dissuaded most companies from touching the mine water.

In January, the state lessened this risk by amending the Pennsylvania Environmental Good Samaritan Act, which protects volunteer groups from liability when cleaning up contaminated streams, to include industrial and commercial facilities.

The treatment plant in Butler County would further protect companies by ensuring the water can be used for drilling as well as stored in their freshwater impoundments without liability, per a consent order and agreement issued by the state Department of Environmental Protection.

“You’re eliminating their liability, and now [the mine water] is an asset,” Steven Winberg, program manager for Battelle, said after sharing project details with a group of natural gas stakeholders at The Shale Exchange workshop in Pittsburgh last week.

Ms. Kotsol said drillers could buy the water during the year-long demonstration on a dollar-per-barrel basis that would be competitively priced with water purchases from streams or municipalities. Water from the plant would offset certain costs such as withdrawal fees, source water storage tanks, pump rentals and labor, she said.

But finding an ideal location for the treatment plants presents a challenge. Drilling companies have no bottom-line incentive to buy the reclaimed mine water if municipal sources are closer and more convenient. Treatment plants would likely need to be deployed to multiple areas with both a legacy of coal mining and active natural gas drilling, such as Washington and Greene counties, for widespread usage to make economic sense.

The Clinton Township site is a good test for whether the industry would be interested, Mr. Walker said.

“If it works out economically [in that location], then what they've done can be duplicated anywhere,” he said.

Ms. Kotsol said Winner Water Services has the attention of several drilling companies, including Range Resources.

Spokesman Matt Pitzarella said in an email on Thursday the Fort Worth-based drilling company sees the “potential approach” that reduces reliability on fresh water.

“At this time, we are still just reviewing this possibility, but remain committed to environmental stewardship programs such as this one,” Mr. Pitzarella said.