9-15-2015

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LOGAN, Utah, Sept. 15, 2015 – The wastewater evaporation ponds that support the oil and natural gas extraction industries in the Uintah Basin may soon help spur the development of alternative bio-based fuels.

Researchers at Utah State University are leading a new collaborative study with colleagues at the University of Utah and BYU in developing ways to cultivate microalgae using spent hydraulic fracking fluid – known as produced water. In turn, the algae-based biomass can be used as a feedstock to produce biofuels, methane-based biogas, plastics and other products.

The study is backed by the Utah Office of Energy Development and will receive $125,000 in funding. The microorganism’s ability to grow in the turbid produced water surprised researchers who’ve worked on dozens of algae studies.

“Theoretically it shouldn’t have grown,” said lead researcher and Utah State professor of biological engineering Ron Sims. “But it actually grew, and it grew very well.”

The algae is grown on rotating drums partially submerged in the produced water that expose the growing microorganisms to both water and sunlight.

Sims says produced water is highly saline but also loaded with organic material and nutrients that microalgae depend on. He says produced water from the Uintah Basin holds significant potential for the cultivation of biomass. The new research effort comes at a time when produced water ponds are being scrutinized for their effects on air quality in the Uintah Basin. Sims says 98 percent of produced water is injected back into the ground. The rest is stored in evaporation ponds. Repurposing the fluid could help mitigate ground water and air quality concerns.

“We’re taking a waste – in this case wastewater from fossil fuel extraction – and we’re converting it into biofuel,” said Sims. “If this works, these companies will be able to take the wastewater that they’d likely store underground or leave in large ponds where it pollutes the atmosphere, and they could turn it into biofuel.”

The algae is grown on rotating drums partially submerged in the produced water that expose the growing microorganisms to both water and sunlight. At night, Sims says the algae may also break down organic petrochemical compounds in the produced water – an added benefit that may further improve water quality.

Sims says once the project is completed and analyzed for cost effectiveness, he anticipates promising economic potential.

“The quantifiable market for the proposed innovation process for produced water to biomass to biofuels will be directly related to the market value for petroleum-based crude and natural gas,” he said. “This research is driven by society’s need for improved air quality and the responsible use of water, especially in Utah’s desert environment.”

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Story Link: http://www.engineering.usu.edu/htm/news/articleID=29965