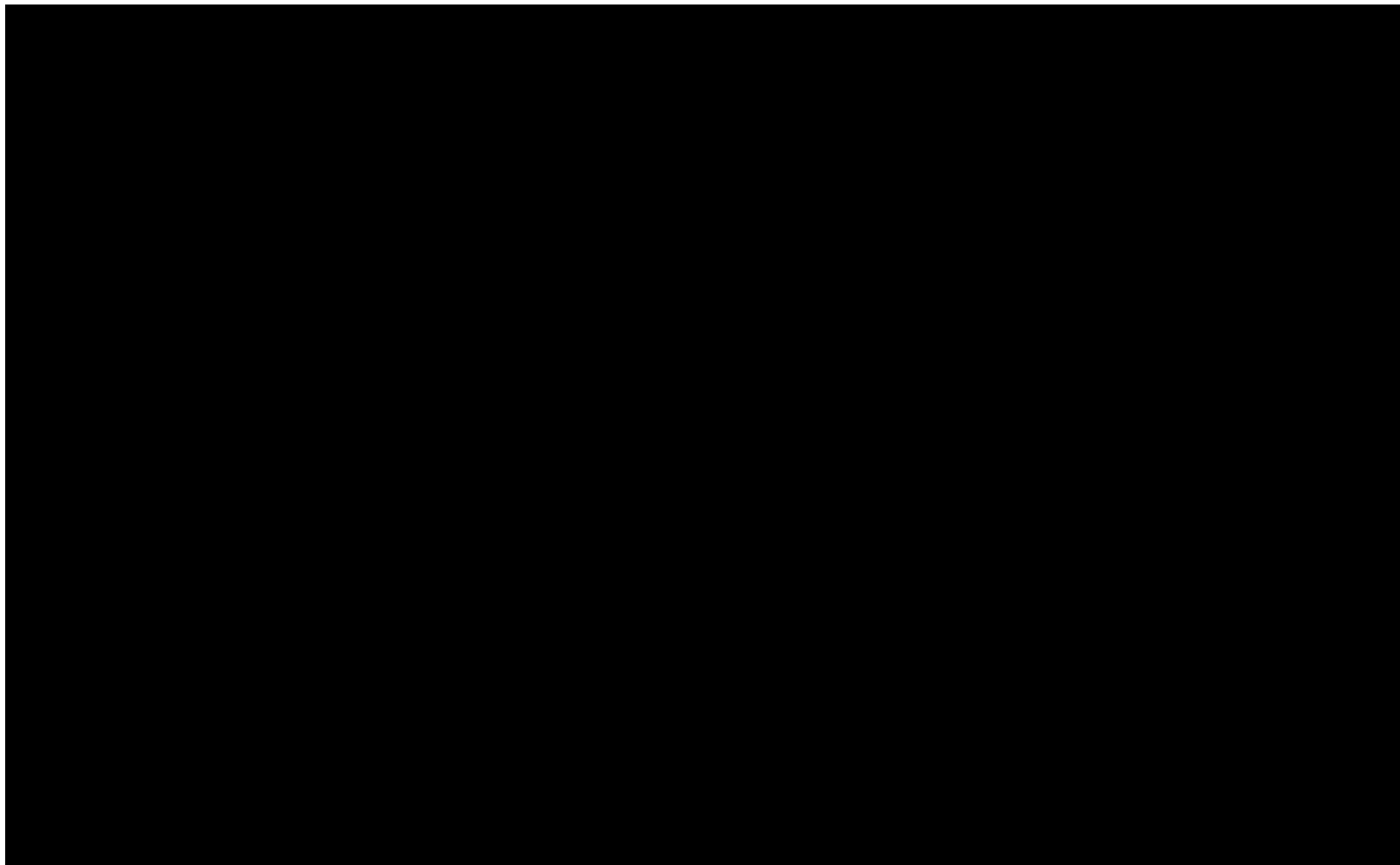


Water management becoming increasingly significant issue

Oil operators must find ways to source, manage millions of gallons of water to complete wells

Mella McEwen mmcewen@mrt.com, Midland Reporter-Telegram Updated 11:13 am, Monday, July 24, 2017



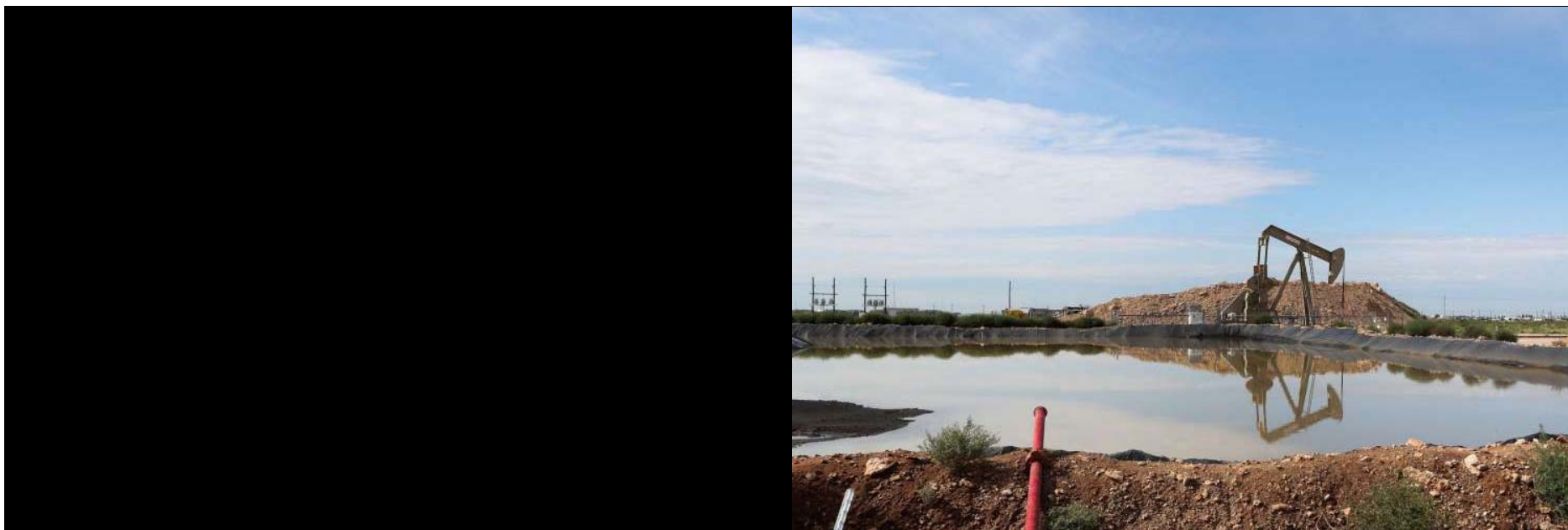


Photo: Steve Gonzales/Houston Chronicle

An oil rigs pumps near Halliburton's fracking site Monday, June 26, 2017, in Midland. (Steve Gonzales / Houston Chronicle)

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Technology has unlocked billions of barrels of crude and natural gas underneath the Permian Basin.

But a perhaps unintended consequence of those technological advances is they have also created an expanding need for water to be used in oil field operations.

The average well requires between 500,000 and 700,000 barrels of water — that's more than 21 million gallons — to be hydraulically fractured, a figure that is expected to only continue climbing as operators drill longer laterals and complete their wells with bigger fracturing jobs, requiring even more water.

Where will that water come from? Operators are increasingly focused on reducing or eliminating their demand for fresh water by recycling and reusing produced or flowback water.

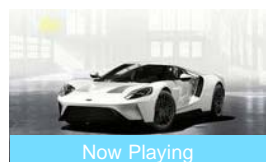
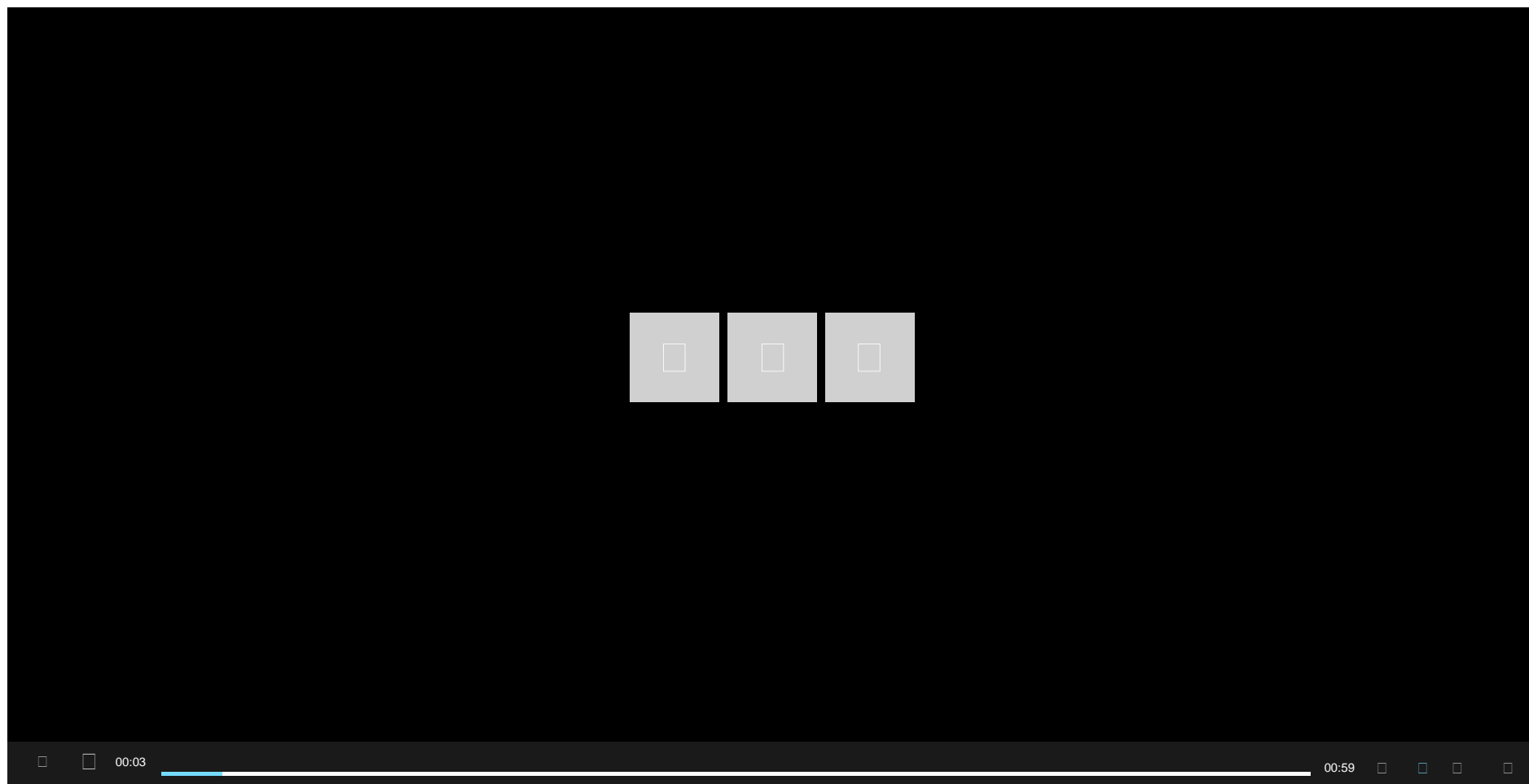
Wells in the Delaware Basin alone are producing enough water to support fracturing operations, said [Bridget Scanlon](#), senior research scientist at the [University of Texas at Austin's Bureau of Economic Geology](#).

Speaking at the Midland chapter, [Society of Independent Professional Earth Scientists](#) recently, she said produced water doesn't require that much treatment to make it fit for fracturing jobs.

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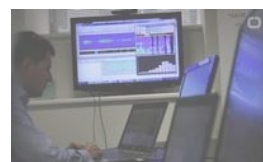
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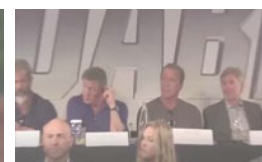
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The barrier is "logistics: Pipelines and storage," she said, predicting water management will be an increasing issue for operators in the future.

Operators are also drilling water wells in brackish formations such as the Santa Rosa. But drawing from aquifers is not sustainable, noted [David Henry](#), owner of Henry Pump. He and his company's general manager, [Trevor Hardway](#), note that there is already some speculation the Santa Rosa is being drawn down.

[J. Michael Anderson](#), senior vice president and chief financial officer with [Layne Christensen Co.](#), overseeing his company's new energy infrastructure business that will provide water to operators in the Delaware Basin, up to 100,000 barrels a day.

"It is a lot of water," he told the Reporter-Telegram by email. "Not all aquifers are able to serve this amount of water very effectively. (But) our hydrology study on our own property — where we did a study both internally and hired a third party to verify for us — concludes that our aquifer can produce significantly more than our 100,000 barrels per day over a period of at least 15 years."

[Pioneer Natural Resources](#), for one, has a goal of increasing its production to a million barrels a day in the next 10 years. That will require the company to not only ensure it has adequate supplies of water but all resources, down to the proppant, said [Todd Abbott](#), vice president of Permian infrastructure development and operations and president of Pioneer Water Management.

"We realized the old method of drilling a fresh water well next to the drill site won't work anymore," he told the Reporter-Telegram by telephone. "You can't take that much water out of the aquifer. So we decided on a sustainable strategy."

The percentage of fresh water used in the company's operations is steadily decreasing with a goal of getting as close to zero as possible, he said.

Among the ways the company is displacing fresh water is its contracts with the cities of Odessa and Midland to purchase their effluent water for use in its fracturing jobs. The company has already built a pipeline to Odessa's water treatment plant and its recent contract with Midland calls for Pioneer to build a new waste water treatment plant for Midland and then purchase the effluent water at the back end, as it does with Odessa. Abbott said ground will be broken on the new plant in early 2018.

He said Pioneer is fortunate to have the size of assets and infrastructure that will let it pipe that water across its operations as needed.

Another source to displace that fresh water is brackish water from reservoirs like the Santa Rosa.

"Longer-term will be the use of produced water from our oil wells," he said. "We've done some pilot projects and are looking to scale that up. Ultimately, as we build out our system, we want to have minimal impact on fresh water zones."

As the industry seeks to move away from fresh water, companies have sprung up offering techniques and treatments for produced, brackish or flowback water.

"What we've found is a lot of people are coming to us and saying they have a treatment that will result in pure water," Abbott said. "We don't need pure water. We can use produced water with a minimal amount of treatment."

He explained that Pioneer still blends its produced water with other waters before putting it in the pipeline. "It's an environmental and safety issue. We're not comfortable putting 100 percent produced water in that pipeline in case something catastrophic happens. We're trying to develop processes and procedures around ensuring we have the best quality for the pipeline in case of something catastrophic."

It's not hard to envision the day when water issues constrain oil production, Abbott said. The issue is new to producers and to regulators, he noted.

Pioneer has the benefit of an infrastructure and a great balance sheet that lets it meet its needs, he said, acknowledging smaller operators will have issues with moving water from its source to their well sites.

To address the issue, he said there may be room for third party operators to move the water, but he says it's more likely industry consortiums will spring up.

"Given the resources, I think we'll figure it out," he said.

As the industry's demand for water has soared, Abbott said public concern has grown about the impact on the fresh water aquifers that supply drinking water.

He wanted to stress that "Pioneer understands that isn't sustainable; our employees live here, too. There are so many better uses for fresh water than pumping it down an oil well."

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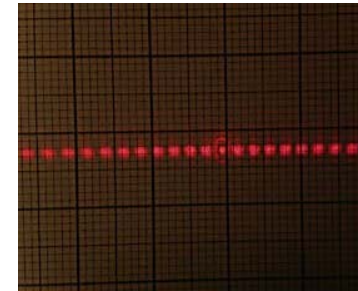
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