

EXPOSING PRODUCED WATER “SCIENCE”

Latest Research is Woefully Incomplete

As New Mexico regulators consider allowing the reuse and potential discharge of oil and gas liquid waste, industry claims that “produced water” can be safely treated are not supported by current science. This analysis reviews the key studies cited in support of that claim and finds they are incomplete, limited in scope, and insufficient to establish safety.

What is Produced Water?

Calling produced water ‘ancient seawater’ is misleading. It is not defined just by salt content, but is a complex industrial waste stream created by oil and gas extraction – one that can contain carcinogens like benzene, heavy metals such as arsenic, radioactive elements including radium-226, volatile organic compounds, and an unknown mix of chemicals shielded by “trade secret” protections. Regulators are being asked to manage a waste stream that is not fully disclosed, and still not fully understood.

Is it Safe to Use as a Fresh Water Source?

No. Current science does not support using treated produced water for any discharge to land or water. The industry and the institutions they fund use a few newer minor studies to falsely claim that oil and gas waste can be treated for dumping into rivers, irrigating crops, and more. But those studies are small-scale projects that don’t translate to full-scale, real-world treatment. Also, these industry-backed studies still do not confirm that all chemicals added for drilling and fracking have been removed.

“Effective” Treatment Has Failed Before

Produced water treatment experiments in Pennsylvania showed promising results, so regulators allowed for permitted discharge. However, the technology did not hold up to real-world, full-scale use over time, resulting in the contamination of rivers. Even when produced water treatment reduced contaminants like barium and radium by over 90%, these toxic pollutants accumulated in stream sediments where treated produced water was discharged into rivers, in some cases by 200%.¹ Researchers also found

¹ Warner, N. et al., *Impacts of Shale Gas Wastewater Disposal on Water Quality in Western Pennsylvania*, *Environmental Science & Technology* 2013 47 (20), <https://doi.org/10.1021/es402165b>

² Pankratz, K., Warner, N., *Radioactivity from oil and gas produced water accumulated in freshwater mussels*, *Science of The Total Environment*, Volume 927, 2024. <https://doi.org/10.1016/j.scitotenv.2024.172151>



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that radioactivity from discharges of treated produced water accumulated in the shells of freshwater mussels, even though treatment technology allegedly proved ‘effective’ at removing all contaminants.²

Why Do People Say It’s Safe?

The oil and gas industry is facing a toxic waste crisis. It generates billions of gallons of produced water every day across the U.S., with the vast majority coming from the Permian Basin. Historically, this waste has been disposed of by injecting it underground—but that system is breaking down. Disposal has pressurized the subsurface, triggering earthquakes, deforming land, and interfering with oil production itself. Industry is running out of places to put its waste.³

Now, as the Southwest faces a real water crisis, industry is attempting to rebrand its waste problem as a water solution—promoting produced water reuse despite major gaps in science, safety standards, and chemical disclosure.

What Do Latest Studies Actually Show?

In November 2024, researchers from the U.S. Geological Survey (USGS) and Health Effects Institute (HEI) concluded a review of 236 publications, examining “what is known about human exposure from current and proposed produced-water management and use.” Their review included studies about “permitted discharges to surface water, crop irrigation, and road treatment.” These researchers concluded, “[t]here are still knowledge gaps about the water’s varying composition, toxicity, and mobility and fate in the environment.”⁴

In May 2025, the New Mexico Water Quality Control Commission (WQCC) passed a rule prohibiting discharges of treated produced water, based on the state of the science. Weeks later, industry petitioned WQCC to revisit produced water discharges, touting “new” science. Since the WQCC’s May 2025 decision, the following studies (Table 1) have been used to falsely claim that current science has removed uncertainties and proves that using oil and gas waste as a freshwater source is safe.

³ Irina Slav, “The Permian Is Drowning in Its Own Wastewater,” *OilPrice*, Dec. 29, 2025. Accessed online 3/30/26: <https://oilprice.com/Energy/Crude-Oil/The-Permian-Is-Drowning-in-Its-Own-Wastewater.html>

⁴ Ariana, A., et al (2025). *Pathways for potential exposure to onshore oil and gas wastewater: What we need to know to protect human health*. *GeoHealth*, 9, e2024GH001263. <https://doi.org/10.1029/2024GH001263>

The Public Would Be the Experiment

The studies reviewed do not establish the comprehensive contaminant thresholds, mixture toxicity data, or long-term environmental impacts required to develop enforceable water quality standards. Without this information, regulators cannot ensure that reuse or discharge would be protective of human health or the environment.

The industry’s proposed rule would allow “demonstration projects” to test produced water reuse in real-world settings. These projects would expose soil, crops, and potentially waterways to treated produced water before safety has been established. This shifts the burden of uncertainty from industry to the public.

Treatment Concentrates Waste

Even when treatment removes certain contaminants, it creates new waste streams, including concentrated toxic brines and solid waste that require disposal.

The studies cited in support of produced water reuse do not address these downstream risks, nor analyze the full build-out of infrastructure needed to transport and store produced water, which increases the likelihood of spills and environmental exposure. The studies cited in support of produced water reuse do not demonstrate that all this can be safely regulated at scale. They are preliminary, incomplete, and do not account for the full range of contaminants or lifecycle risks involved.

As regulators consider whether to move produced water reuse proposals forward, they must decide whether incomplete science is sufficient to justify exposing New Mexico’s land, water, and communities to a complex and largely unknown waste stream. The following studies are frequently cited to support claims that produced water can be safely reused. However, a closer review shows that each study is limited in scope and does not support those conclusions.

PUBLISHED	TITLE	RESULTS	FALSE INTERPRETATION
March 2026	Pilot-scale evaluation of hypersaline produced water treatment and reuse...Organic removal, aquatic and human cell line toxicity studies	Three types of human cells survived one 24-hour exposure to treated produced water. Some treatment increased tetrahydrofuran above level in raw produced water. Residual ammonia required treatment. Broader study is still needed.	“The technology is there.” – <i>John Rhoderick, NMED</i> (ABQ Journal, 2024) Any statement that produced water treatment has been proven ‘safe’ continues to be inappropriate. Technology is still being tested.
December 2025	Separation performance in pilot-scale fractional freeze desalination and reverse osmosis for produced water reuse	Achieved over 95% removal efficacy for most parameters that were tested for . Some contaminants “occasionally” exceeded regulatory thresholds. Some contaminants remain unknown. Not all data has been released. First-ever pilot (small-scale) of its kind. More studies needed to replicate results, scale up, test real-world scenarios.	“Better than drinking water.” – <i>Dr. Stoll, NM Produced Water Research Consortium</i> (Roundhouse, 2026) One study of a new treatment at small-scale does not mean technology is ready to deploy full scale for discharge to rivers and crops used for drinking and eating.
September 2025	Plant growth, ion dynamics, and microbial communities in soils irrigated with treated produced water for sustainable agriculture	“Future extended field application across successive growing seasons is recommended to further validate its long-term viability and investigate the potential progressive accumulation of residual salts and trace organic constituents in treated produced water on soil physicochemical characteristics and microbial dynamics, thereby influencing soil health and crop productivity.”	“...treated produced water can be used in various reuse applications without adverse impact to aquatic species, soils and plants...” (WATR petition, 2026) The research clearly concludes that more study is needed to “validate its long-term viability...”
July 2025	Comprehensive cytotoxicity assessment of treated produced water from thermal distillation using human cell lines	More study needed. “Further development of thermal distillation and post-treatment technologies is warranted to mitigate potential VOC carryover and ensure consistent product water quality.” Volatile organic compounds can still be problematic in treated produced water.	Rhetoric clings to parts of one sentence: “These findings suggest that, with appropriate treatment, produced water can be suitable for safe discharge or beneficial reuse.”

TABLE 1: Studies used by industry and its supporters to claim that produced water treatment technology is safe enough for river discharge, crop irrigation, and other environmental applications.