FACT SHEET | RESEARCH GAPS

Treated Produced Water in New Mexico

State of the Science: Uncertainties in Risks to Human Health and Environment Are Too Great for Discharge

Bottom line: Recent research examines the safety of technologies to treat produced water, a waste product generated by drilling and production of oil and gas. In a new **white paper**, Industrial Economics, Inc. (IEc) examines recent research, including key studies produced by scientists with the New Mexico Produced Water Research Consortium (NMPWRC) and partners, and finds that, while commendable, significant uncertainties remain in the risk to human health and the environment from discharge of treated produced water to surface and ground water. The conclusion: Maintaining the current prohibition on discharge of treated produced water allows pilot projects and research to continue without undue potential risk to public health and the environment.

Why it matters now: New Mexico Water Quality Control Commission (WQCC) rules at 20.6.8 NMAC (effective July 2025) prohibit discharging treated and untreated produced water to surface and ground water, while allowing non-discharging pilots projects to move forward. However, the WQCC voted to hear an industry rulemaking petition to reverse the prohibition based on an assertion that NMPWRC research shows reuse is safe. And industry is pushing for legislation that would require the WQCC to pass rules to allow discharge and reuse.

Scorecard: Do recent NMPWRC studies address knowledge gaps?

Knowledge Gaps	Tarazona 2024	Wijekoon 2025	Senanayake 2025	Tarazona 2026	Edirisooriya 2026
Toxicity/risk to humans addressed?	No	Partially	No	No	Partially
Toxicity/risk of known contaminants addressed?	Partially	Partially	Partially	Partially	Partially
Toxicity/risk of unknown contaminants addressed?	Partially	Partially	Partially	Partially	Partially
Toxicity/risk to aquatic species addressed?	Partially	No	No	Partially	Partially
Toxicity/risk to terrestrial species addressed?	No	No	Partially	No	No
Toxicity/risk to mammals addressed?	No	Partially	No	No	Partially
Bioaccumulation / long-term effects addressed?	No	No	No	Partially	Partially
Spatial/temporal variability addressed?	No	No	No	No	Partially
Environmental fate and transport addressed?	No	No	No	No	No

No study fully addressed any gap. “Partially” = addressed in a limited way (e.g., one batch of water, a subset of species). Ratings are IEc’s qualitative assessments.

Background:

The safety of reuse and discharge of treated produced water is hotly debated in New Mexico. ***Produced Water in New Mexico: A Critical Review of Recent Toxicity and Risk Assessment Literature (Produced Water Critical Review)*** a literature review and analysis prepared by IEc and commissioned by Amigos Bravos, reviews the current state of the science on the risks to human health and the environment of discharge of treated produced water to surface and ground water. The *Produced Water Critical Review* identifies important gaps in the state of the science regarding the safety of discharge of treated produced water, concluding that maintaining the *status quo* New Mexico’s prohibition against discharge will allow for ongoing research without posing undue risk to the environment and public.

The Water Access Treatment & Reuse Alliance (WATR Alliance), an industry-supported organization, seeks to authorize reuse and discharge of treated produced water in its rulemaking petition to the WQCC claiming that recent scientific studies, including those conducted through the NMPWRC, “indicate that produced water can be treated to a non-toxic level in a real-world setting.” The *Produced Water Critical Review,* focusing on five articles published in conjunction with the NMPRWC between 2024 and 2026, concludes otherwise:

“Ultimately, the incremental advances in scientific knowledge accomplished by the NMPWRC in the past several years, while commendable, still fall short of addressing a number of information gaps that would need to be filled to fully assess the human and ecological risks of discharging ‘post-treated’ produced water to surface or groundwater.”

Source: IEc, “Produced Water in New Mexico: A Critical Review of Recent Toxicity and Risk Assessment Literature” (Oct. 26, 2026), prepared for Amigos Bravos.

"From a regulatory risk assessment perspective, the gaps that have been addressed by recent papers pertaining to 'post-treated' water have not been reproduced by third parties and do not, even in aggregate, reflect a comprehensive toxicity or risk evaluation."

"The current status quo prohibition on the discharge of treated produced water to surface and groundwater allows for pilot projects and scientific research and advancements. In light of the lingering gaps described in this report, and other lingering gaps not addressed herein, maintaining the *status quo* prohibition will allow ongoing research and testing to proceed without posing an undue risk to the environment and the public."

The research gaps in detail

Toxicity to humans and mammals	The limited number of studies on human cells represent an incomplete evaluation of the potential toxicity of treated produced water to humans. Crucial information—including a thorough evaluation of the full range of known and unknown constituents in produced water, including after treatment, and their toxicity—is lacking. The papers do not sufficiently address the risks to humans and other mammals of treated produced water. Tarazona et al. (2026) highlights that "long-term exposure studies using both aquatic organisms and mammalian models are warranted to further improve our understanding of the safety of treated [produced water] for both direct and indirect receptors."
Toxicity and risk of known contaminants	The NMPWRC has tested Permian Basin produced water samples for 600 analytes and identified 290. However, roughly 1,200 substances have been found in produced water nationwide. Whether Permian Basin produced water lacks the balance of these substances is unknown. Whether additional unmeasured toxic or potentially toxic analytes in the Permian Basin contribute to toxicity remains a significant knowledge gap.
Toxicity and risk of unknown contaminants	Many produced water chemicals can't be measured with standard methods, and nearly half lack data for risk assessment, including possible carcinogens with no safe exposure level. None of the studies characterized the unresolved organic matter that remained.
Toxicity and risk to aquatic species	Tests covered only a subset of species, mostly short-term, using single source water mixtures. Standard lab tests can miss outliers: 6PPD-quinone, harmful to coho salmon, is an example of a toxin not tested for in standard tests.
Toxicity and risk to terrestrial species	Only one study (greenhouse plants, 40 weeks) addressed terrestrial species. It did not assess uptake of contaminants into plant tissue, long-term salt build-up, or effects on animals or wildlife. Both control and irrigated soils were contaminated with petroleum hydrocarbons.
Risk of bioaccumulation and long-term effects	No study tested bioaccumulation. Some known constituents (PFAS, mercury, selenium) bioaccumulate. Radium has been shown to accumulate in stream sediments near produced water wastewater discharges in Pennsylvania.
Spatial and temporal variability	Produced water varies by formation, location, operator, and over time. Four of five studies used a single source; one sampled over ~7 months, but composite sampling masked spatial differences. Whether NMPWRC's 75 produced water tested samples represent New Mexico's produced water is unknown.
Fate and transport	No study examined how residual chemicals move, change, or accumulate once released. Contaminants can transform in the environment, and none of the studies addressed this.

Takeaway: The NMPWRC research represents progress on treatment technologies, yet even the authors of the studies acknowledge that work remains. A handful of small bench and pilot-scale studies—none reproduced independently and none addressing fate and transport—does not amount to a comprehensive or adequate risk evaluation. These substantial gaps mean that the discharge prohibition should be maintained while research continues.

QR Code to Paper:

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