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Tennessee Passes First-Of-Its-Kind Law To Require "Sound Science" In Environmental Regulations

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Commentary

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Introduction

In recent years, there has been increasing public attention paid to various emergent chemicals, most notably per- and polyfluoroalkyl substances (PFAS), as well as microplastics, the solvent 1,4-dioxane, and the rubber stabilizing additive 6PPD-quinone, among others.

There is an inherent risk that fast-developing news coverage and NGO advocacy with respect to emergent chemicals or other substances could pressure some state agencies to hastily adopt costly regulations driven by unfounded fears or underdeveloped science rather than rigorous, well-founded scientific consensus.

To foster a sensible and predictable regulatory environment, Tennessee recently enacted a pioneering law (S. 880) that requires sound science in state-level regulations. The "Sound Science in Regulations Act"[1] amends Tennessee's Uniform Administrative Procedures Act to require certain environmental regulations established by an agency such as the Tennessee Department of Environmental Conservation (TDEC) to be based on the "best available science" – a commonsense concept that is found in several federal laws governing United States Environmental Protection Agency (EPA) regulations. TDEC worked cooperatively with the sponsor and other stakeholders to develop the Act.

The Sound Science in Regulations Act is intended to avoid public policy overreaction to events that may unduly influence rules for emergent or other chemicals. The law is also aimed at focusing state regulators on substances that have been directly linked to manifest bodily harm in humans.

The Act will result in stronger scientific products and raise the public's trust in agency decisions by ensuring that new environmental regulations are scientifically defensible. It is a sound model for other states.

Key Features of *Sound Science in Regulations Act*

Environmental Regulations Must be Supported by the "Best Available Science"

Tennessee's Sound Science in Regulations Act provides that "[a]n agency shall not adopt a rule establishing numeric criteria or numeric limitations," such as a maximum contaminant level (MCL), "applicable to a contaminant, pollutant, hazardous

substance, solid waste, or hazardous waste" that "relates to drinking water, water pollution control, hazardous substances, contaminated site remediation, air quality, or solid or hazardous waste handling" unless "[s]cientific and technical information relied on to support the rule is based upon the best available science."[2]

Further, with respect to rules pertaining to human health, the "best available science" must establish "a direct link, based on generally accepted scientific practice, to manifest bodily harm in humans."[3] This may be shown through data from voluntary scientific studies on humans. In the absence of such data, "tests performed on experimental animal species or human and animal cells" may suffice if they "indicate [that] exposure at or above the numeric criteria or numeric limits establishes a direct link, based on generally accepted scientific practice, to manifest bodily harm in humans."[4] The Act thus anchors any numeric criteria or numeric limitations set by an agency to valid science demonstrating clear human health impacts from exposures at or above the prescribed limits while avoiding costly regulations based upon mere speculation about the potential for a substance to cause harm at a particular level.

To date, regulators in Tennessee have typically taken a conservative approach when setting limits and regulating emerging issues by generally choosing not to get out in front of the science and by not setting criteria or limits that are more stringent than federal levels. But administrations, policy choices, and regulatory philosophies can change. The legislature determined that it is sensible to rely on the common-sense standard of "best available science" no matter the prevailing approaches to policymaking and regulation in Tennessee.

The general concept of requiring agency decisions to be based on the "best available science" is well-established in federal law. For example, Congress requires the EPA to use the "best available science" in regulatory actions tied to several core federal environmental statutes, including:

- *Safe Drinking Water Act:* EPA's administrative and regulatory duties, such as setting National Primary Drinking Water Standards for certain substances, must be based on "the best available, peer-reviewed science and supporting studies conducted in accordance with sound and objective scientific practices."[5]

- *Clean Water Act:* the section on oil and hazardous substances discharge prevention and containment incorporates a "best available science" standard, which is defined as science that "maximizes the quality, objectivity, and integrity of information, including statistical information" and uses "peer-reviewed and publicly available data…."[6]

- *Toxic Substances Control Act:* Risk evaluations performed by EPA on chemical substances under TSCA must be "consistent with the best available science."[7]

Defining "Best Available Science"

The Sound Science in Regulations Act defines "best available science" as science that:

> (1) "Is reliable, unbiased, and reasonably applied to the agency's rule";
>
> (2) "Maximizes the quality, objectivity, and integrity of information, including statistical information; human, animal, and other relevant scientific studies; and, if applicable, human health risk-based assessments"; and
>
> (3) "Involves the use of supporting studies conducted in accordance with generally accepted scientific or technical practices utilizing data collected by generally accepted methods or best available methods…."[8]

Addressing Concerns over Predatory Journals and "Junk Science"

The Act specifies the types of "supporting studies" that may be considered by a state agency in establishing rules pursuant to the Act (assuming the other requirements pertaining to reliability and objectivity are met). The agency may only rely on the following:

> (1) site-specific studies, including area-wide or statewide studies;
>
> (2) studies published in a "refereed journal";

> (3) externally peer-reviewed studies contained in a federal government report published for a purpose other than to develop an agency rulemaking (i.e., objective science reviewed by external experts, but not self-serving reports published by a federal agency to justify its own rule); and
>
> (4) certain numerical limits published by the EPA (i.e., "Maximum contaminant levels (MCLs), Regional Screening Levels (RSLs), and vapor intrusion screen levels (VISLs)") so long as the state agency does not use those levels to justify state-level numeric criteria or numeric limitations that are lower than the federal levels.[9]

The law defines a "refereed journal" as a publication that "[u]ses an editorial board or critical review panel of subject matter experts in the relevant scientific or technical disciplines who critically and objectively assess the methodology and analysis of submitted scientific studies in a nonpartisan fashion and provide editorial services prior to publication" and that "[t]akes meaningful steps to avoid biases in its scientific review process."[10]

The Act's definition of "refereed journal" is aimed at combatting regulatory decisionmaking that may unwittingly rely on unreliable or flimsy data, or even fake studies. The *Wall Street Journal* reports that "large-scale research fraud" has led to "thousands of retractions" in recent years, threatening "the credibility of science as a whole."[11] In 2024, nearly two dozen scientists "excoriated" the largest individual for-profit scientific journal for failing "to protect the scientific literature from fraudulent and low quality" research.[12]

Publication of "junk science" is especially problematic in so-called "predatory journals" (also called "deceptive publishing"). The *New York Times* has noted the prevalence of journals "that will publish almost anything, for fees that can range into the hundreds of dollars per paper."[13] Experts have called studies in such journals "academic fraud that wastes taxpayer money, chips away at scientific credibility, and muddies important research."[14] In early 2025, editors at some of the world's prestigious journals wrote in the *New England Journal of Medicine* that "predatory journals can facilitate the dissemination of unvetted, weak, or even fraudulent health information."[15] The Sound Science in Regulations Act aims to reduce the possibility of pseudo-science serving as a basis for environmental regulations in Tennessee.

Effective Date and Relationship to Federal Environmental Standards

Tennessee's Sound Science in Regulations Act does not apply to rules adopted on or before its July 1, 2025 effective date; it is not retroactive. Also, the Act only covers state-level rules that are "more stringent than any applicable federal regulation or adopted in the absence of a federal regulation."[16]

Thus, going forward, state environmental regulators may finalize a rule that is more stringent than a federal standard or adopt a standard in advance of or in the absence of a comparable federal rule so long as the state rule is rooted in the Act's standard of "best available science."

The Act also does not apply to any rules that Tennessee regulators are required to finalize pursuant to federal law (such as rules addressing federal primacy requirements), any rule that is the "substantive equivalent to a federal regulation," or emergency rules that state regulators are empowered to finalize under state law.[17]

States Getting Out in Front on Regulating ''Emerging Chemicals''

Tennessee's "Sound Science" legislation has arrived at a moment when federal and other state approaches to emerging chemicals are evolving rapidly. Some states have developed regulations ahead of EPA, and some have adopted standards that are more stringent than EPA where the EPA has acted.

For example, between 2018 and 2020, environmental regulatory agencies in states such as New Hampshire,[18] Vermont,[19] and New Jersey[20] established drinking water standards for certain PFAS chemicals. New Hampshire set MCLs for PFOA at 12 parts per trillion (ppt), for PFOS at 15 ppt, PFHxS at 18 ppt, and PFNA at 11 ppt. Vermont set an MCL where the sum of PFOA, PFOS, PFHxS, PFHpA, and PFNA cannot exceed 20 ppt. New Jersey set MCLs for PFOA at 14 ppt, PFOS at 13 ppt, and PFNA at 13 ppt.

Ultimately, many other states implemented some form of drinking water advisories or standards for one or more PFAS chemicals before any final EPA action.

Considered together, these individual state actions created different enforceable and non-enforceable standards at different numeric limits that addressed different individual PFAS chemicals.

As a point of comparison, in 2021 EPA released its *PFAS Strategic Roadmap* to outline the Agency's regulatory and policy commitments through 2024 related to PFAS. While committing to a number of regulatory actions that the Biden Administration would ultimately finalize, the Agency stressed that the body of scientific research and understanding around PFAS is still rapidly developing. The Agency noted, "EPA's decisions regarding PFAS will be grounded in scientific evidence and analysis. The current body of scientific evidence clearly indicates that there are real, present, and significant hazards associated with specific PFAS, *but significant gaps remain related to the impacts of other PFAS on human health and in the environment. Regulatory development, either at the state or federal level, would greatly benefit from a deeper scientific understanding of the exposure pathways, toxicities, and potential health impacts of less-studied PFAS*."[21]

By April 2024, EPA established final MCLs for five individual PFAS chemicals and one standard for a mixture of PFAS chemicals as National Primary Drinking Water Standards under the federal Safe Drinking Water Act. The MCLs for PFOA and PFOS were set at 4 ppt; the MCLs for PFHxS, HFPO-DA (often referred to as GenX), and PFNA were set at 10 ppt; and the hazard index approach would consider any mixture of two or more of HFPO-DA, PFHxS, PFNA, and PFBS against a unitless level of 1.

Just over one year later, however, on May 14, 2025, EPA Administrator Lee Zeldin declared that the current Administration intends to retain the finalized MCLs for PFOS and PFOA (while also committing to extend the compliance deadlines by separate rulemaking), but rescind the finalized MCLs for PFHxS, PFNA, HFPO-DA, and the hazard index mixture approach. The announcement also indicated that EPA will continue to defend the PFOS and PFOA standards that are still being challenged in court.[22]

Prior to EPA's announcement of its intention to rescind the finalized enforceable drinking water standards, many early-action states issued announcements that they would continue to explore whether to finalize additional state-level numeric criteria for more PFAS chemicals or even finalize more stringent enforceable levels than what EPA had developed.
For example, the Michigan Attorney General issued a press release stating that "[s]ome of the EPA standards are more restrictive than Michigan's, and some are less restrictive. The EPA provided five years for public water supplies to undertake sampling and reach compliance with the new standards. In that time frame, Michigan will work with public water supplies to develop and implement changes needed to meet or exceed federal requirements."[23]

Similarly, the New York Department of Health stated that it "is working to pass even more drinking water standards and notification levels for up to 23 PFAS… The Department continues to review the evolving science around health risks associated with drinking water contaminants, closely follow efforts by the EPA and other states, and will update or develop additional drinking water standards as needed to protect public health."[24]

Federal and state regulation of other emerging chemicals, like 1,4-dioxane, is similarly fluid. At present, there is no enforceable federal National Primary Drinking Water Standard for 1,4-dioxane. In 2020, however, New York set a first-in-the-nation MCL for 1,4-dioxane at 1 ppb.[25] States such as New Jersey and California are in the process of setting their own state-level 1,4-dioxane drinking water standards.

State-level interest in regulating microplastics in a variety of environmental media also continues to grow along with the developing science. In 2018, California became the first state to require regulators to develop a definition of "microplastics" in drinking water and standardize a method for testing.[26] Enforceable limits for microplastics in drinking water may follow.

There is little reason to suspect that aggressive states will let up on setting enforceable standards within their jurisdiction. For example, the advocacy organization SaferStates published its *2025 Analysis of State Legislation Addressing Toxic Chemicals and Plastics* and stated that it anticipates in 2025 alone that "at least 32 states and the District of Columbia will likely consider at least 340 policies that address toxic chemicals in products such as PFAS, plastics, and cosmetics as well as other toxic pollution issues including PFAS discharge and sludge limits."[27]

In this fluid environment, Tennessee's Sound Science in Regulations Act law is a helpful model for other states seeking to provide predictability and further sound public policy in environmental regulations while providing flexibility for regulators to protect public health.

Conclusion

Tennessee's 2025 "Sound Science in Regulations Act" enshrines clear criteria that govern certain future state-level environmental regulations for emerging and other chemicals. The Act allows Tennessee regulators to adopt enforceable criteria or numeric limits for emerging chemicals that are more stringent than an existing federal standard or in the absence of a nationwide standard. The Act simply ensures that any such regulatory action is consistent with the "best available science."

Other states should consider similar legislation to ensure that environmental regulations are guided by the principles of "sound science," especially for emerging chemicals where scientific study, data collection, and assessments of direct impacts to human health continues to develop.

Endnotes

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2. *Id.* (to be codified at Tenn. Code Ann. § 4-5-232(a)(1)).
3. *Id.* (to be codified at Tenn. Code Ann. § 4-5-232(a)(2)).
4. *Id.*
5. 42 U.S.C. § 300g-1(b)(3)(A).
6. 33 U.S.C. § 1321(a)(27).
7. 15 U.S.C. § 2625(h).
8. S. 880, 2025 Reg. Sess. (Tenn. 2025) (to be codified at Tenn. Code Ann. § 4-5-232(b)(1)).
9. *Id.*
10. S. 880, 2025 Reg. Sess. (Tenn. 2025) (to be codified at Tenn. Code Ann. § 4-5-232(b)(2)).
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