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# EPA Finalizes Risk On 1,4-Dioxane: What Water Utilities Must Know

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On November 13, 2024, the U.S. Environmental Protection Agency (EPA) finalized its revised [unreasonable risk determination for 1,4-dioxane](#) under the Toxic Substances Control Act (TSCA). This determination, which was announced to little fanfare, is the result of a supplementary risk evaluation released in 2023, which incorporated public comments, peer reviews, and new data on exposure pathways. As a result, EPA has concluded that 1,4-dioxane poses an unreasonable risk to human health, necessitating regulatory action to mitigate these risks. The announcement marks several changes in position on the substance and how water authorities are expected to respond.



## What Is The Final Risk Determination?

The EPA's final determination identifies 1,4-dioxane as a significant threat to human health due to cancer and non-cancer risks, primarily through both occupational exposure and drinking water contamination. In particular, the general population is at risk from industrial discharges and consumer product residues contaminating surface water used for drinking.

The final determination expands on the conditions of use (COUs) contributing to unreasonable risks. For example, the revised evaluation aggregates exposure data from multiple sources, including products where 1,4-dioxane occurs as a byproduct. In addition, the EPA has adopted a whole-chemical approach — evaluating the potential risks of an entire chemical substance as it exists in commerce — rather than evaluating individual COUs separately.

## Changes From The Draft Determinations

The 2023 draft determination initially identified fewer COUs as contributors to unreasonable risk. For example, surface cleaners were initially considered safe but are now deemed to pose risks to fenceline communities — residential neighborhoods located near industrial facilities — through contaminated drinking water. Similarly, risks from laundry and dishwashing products were originally confined to high-exposure occupational scenarios. The final determination identifies additional risks to the general population from drinking water contamination.

Several factors lead to EPA's shift in stance on 1,4-dioxane. This includes additional data on updated exposure estimates, including data from the New York Department of Environmental Conservation (NYDEC). This data highlighted higher historical concentrations of 1,4-dioxane in consumer products. In addition, EPA updated its methodology, applying a linear low-dose extrapolation model for cancer risk assessment, emphasizing the absence of a threshold for safe exposure. Finally, comments prompted EPA to revisit its earlier assumptions and address broader exposure pathways, including legacy contamination in drinking water.

## Increased Focus On Drinking Water

The final determination puts extra emphasis on drinking water contamination. Industrial discharges, down-the-drain disposal, and legacy pollution contribute to significant risks for fenceline communities and the general population. By comparison, the draft evaluation underestimated drinking water as a key exposure pathway.

Under TSCA Section 6(a), the EPA is mandated to propose risk management actions to mitigate the identified unreasonable risks. These actions may include regulating manufacturing, processing, distribution, and disposal activities associated with 1,4-dioxane, as well as coordinating with other EPA offices to address drinking water contamination under the Safe Drinking Water Act (SDWA).

While no new regulations have yet to be proposed in response to this determination, water treatment plants (WTPs) should consider taking proactive measures to mitigate the presence of 1,4-dioxane in public water supplies.

To prepare, water utilities should consider the following steps:

1. **Monitoring and testing.** Implement regular monitoring programs to detect and quantify 1,4-dioxane levels in source water and finished drinking water. This data will help in assessing the extent of contamination and the effectiveness of treatment processes.
2. **Advanced treatment technologies.** Evaluate and, if necessary, upgrade treatment facilities to include advanced oxidation processes (AOPs) or other methods shown to effectively reduce 1,4-dioxane concentrations in water.

- 3. **Source control.** Collaborate with local industries and regulatory agencies to identify and control sources of 1,4-dioxane entering the water supply. This may involve reviewing industrial discharge permits and promoting best practices to minimize releases.
- 4. **Public communication.** Inform the public about the presence of 1,4-dioxane, potential health risks, and the steps being taken to ensure water safety. Transparent communication can help maintain public trust and compliance with any necessary water use advisories.

The EPA’s revised risk determination for 1,4-dioxane reflects a broader and more precautionary approach to assessing chemical risks. However, the incoming presidential administration may prioritize this and other risks differently, leaving a great deal of uncertainty as to what exactly will be required of water authorities in the coming months or years.

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