Protecting Groundwater with Groundwater Quality Standards

Carla Romano[1] (carla.romano1@wisconsin.gov), Bill Phelps[1]

[1]Wisconsin Department of Natural Resources

Wisconsin Groundwater Law

The intent of the Chapter 160 of the Wisconsin Statues is to minimize the concentration of contaminants in groundwater by establishing state numerical groundwater quality standards.

- Ch. 160 provides detailed methodologies for developing recommendations for groundwater quality standards by the Wisconsin Department of Health Services (DHS).
- Ch. 160 mandates the Department of Natural Resources (DNR) to establish numeric groundwater standards, based on DHS recommendations, in **Wisconsin Administrative Code Chapter NR 140.**

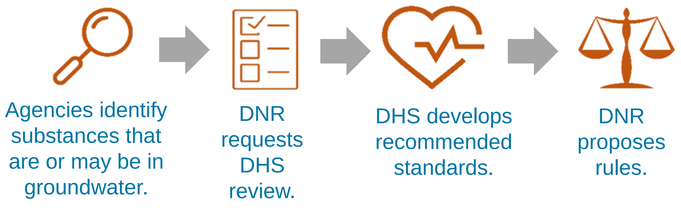


Figure modified from Yang S. (2020)

NR 140 – Groundwater Quality Standards

NR 140 establishes Groundwater Quality Standards for substances present or likely to enter the state's groundwater and provides guidelines for designing and managing **regulated activities and facilities** (spills and remediation sites, solid and hazardous waste management, land treatment of wastewater, bottled water quality, etc.) to prevent the release of substances at concentrations that could cause an exceedance of the standards.

Types of standards

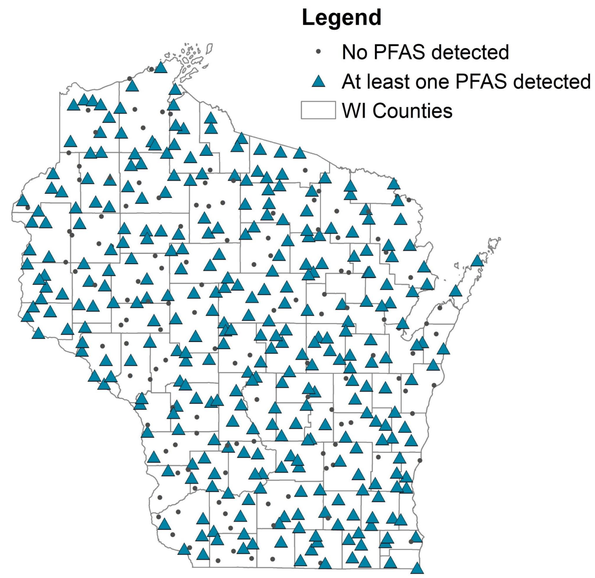
- Enforcement Standards (ESs): trigger a regulatory response for action to achieve and ensure compliance.
- Preventive Action Limits (PALs): Lower thresholds (10-20% of an ES) that signal potential contamination.

NR 140 applies broadly to all Wisconsin groundwater. While it does not regulate water quality in private wells directly, it benefits private well owners by ensuring the safety of their groundwater drinking water supply.

NR 809 establishes state drinking water standards and only applies to public water systems (community wells, restaurants, hotels, etc.)

Current rulemaking for PFAS substances

Per- and polyfluoroalkyl substances (PFAS) are a vast group of synthetic chemicals that have been used in industries and consumer products worldwide since the 1950s. PFAS have been linked to several health issues including cancer, liver damage, immune system effects, and developmental disorders. These chemicals have been found in Wisconsin's groundwater. About 70% of Wisconsinites get their drinking water from groundwater.



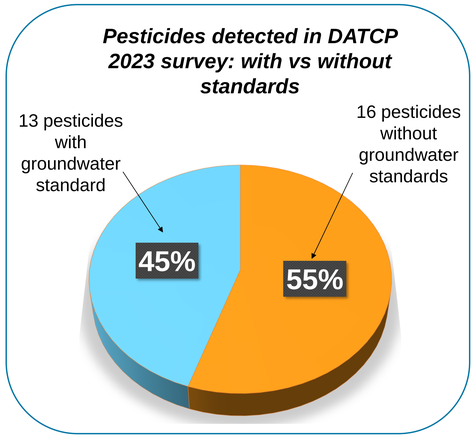
Data collected randomly from private potable wells during the 2022 PFAS statewide survey (Silver et al., 2023)

- In April 2024, the U.S. EPA finalized drinking water standards for six PFAS compounds.
- In May 2024, DNR requested updated groundwater standards from DHS.
- In January 2025, DNR received DHS recommendations and began the rulemaking process.
- This is DNR's fourth attempt to establish PFAS groundwater standards, now following federal regulations.

PFAS compound	Pre-2025 DHS enforcement standard recommendations (in ng/L or ppt)	2025 DHS enforcement standard recommendations (in ng/L or ppt)	EPA federal numbers (in ng/L or ppt)
PFOA	20	4	4
PFOS	20	4	4
PFHxS	40	10	10
PFNA	30	10	10
PFBS	450,000	2,000	2,000
HFPO-DA	300	10	10

Upcoming efforts

The Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) estimated that in 2023 at least one pesticide was present in 43% of private potable wells in the state (Romano et al., 2024).



Of the 29 detected pesticides, only 13 have established groundwater standards.

In 2019 and 2020, DNR attempted to establish groundwater standards for some of the 16 pesticides without standards, but these rulemaking efforts were unsuccessful.
Within a year, DNR anticipates it will request DHS to reevaluate recommendations for some of these pesticides.

References

Romano C., Cook C., Potrykus K., McColloch M., Berzinski R., Personette R., Blanchard D., Engelhardt A., Gramse M., Kelley G.(2024). *Agricultural Chemicals in Wisconsin Groundwater.* Wisconsin Department of Agriculture, Trade and Consumer Protection. https://datcp.wi.gov/Documents2/2023StatewideGroundwaterSurveyReport.pdf

Silver, M., Phelps, W., Masarik, K., Burke, K., Zhang, C., Schwartz, A., Wang M., Nitka A.L., Schutz J. Trainor T., Washington J. W., Rheineck, B. D. (2023). *Prevalence and source tracing of PFAS in shallow groundwater used for drinking water in Wisconsin, USA*. Environmental Science & Technology, 57(45), 17415-17426.

Yang, S. (2020). *Setting Groundwater Standards to protect Public Health*. Wisconsin Department of Health Services. https://www.dhs.wisconsin.gov/publications/p02816.pdf

Contact info

Stay informed about the latest NR 140 rulemaking efforts by:

- Scanning this QR code.
- Sending an email to DNR140GroundwaterQualityStandards@Wisconsin.gov
- Subscribing to GovDelivery updates about *NR 140 Rule Changes* at https://public.govdelivery.com/accounts/WIDNR/subscriber/new

DNR NR 140 website