

Groundwater and PFAS: State of Knowledge and Practice

Legal and Regulatory Framework Section 6

One of eight sections prepared by National Ground Water Association volunteers. Each section was prepared to stand independently, or to be integrated with the other seven sections.



Legal and Regulatory Framework

TERMINOLOGY

Groundwater quality standards

Groundwater quality standards can be either numeric or narrative. Numeric groundwater standards prescribe maximum allowable contaminant levels that result from human operations or activities, but do not typically apply to naturally occurring contaminants at naturally occurring levels. A narrative standard is descriptive of conditions necessary to support a designated groundwater use or may generally prohibit the discharge of particular types of contaminants. Numeric and narrative standards may be used separately or conjointly. Groundwater quality standards are enforceable standards.

Health advisories

Health advisories provide information on contaminants that can cause human health effects and are known or anticipated to occur in drinking water. Health advisories are nonenforceable and nonregulatory and provide technical information to public health officials on health effects, analytical methodologies, and treatment technologies associated with drinking water contamination.

Maximum contaminant level (MCL)

MCLs represent the highest level of a contaminant that is allowed in drinking water that enters the service network. MCLs are enforceable standards.

Maximum contaminant level goal (MCLG)

MCLGs represent the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are nonenforceable public health goals.

Secondary maximum contaminant level (SMCL)

Under its National Secondary Drinking Water Regulations, EPA established SMCLs that set nonmandatory water quality standards. They are established as guidelines to assist public water systems in managing their drinking water for aesthetic considerations such as taste, color, and odor. These contaminants are not considered to present a risk to human health at the SMCL.

STATUTORY AND REGULATORY AUTHORITY

There are multiple layers of laws and rules that govern PFAS in the environment. At the federal level, a number of laws may apply, including the Toxic Substances Control Act (TSCA) related to the manufacture and use of PFAS; the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) related to remediation of contaminated sites; and the Safe Drinking Water Act (SDWA) related to the presence of contaminants in drinking water. All have a role when PFAS are released into the environment. In addition, each state may have analogous standards that can be stricter than their federal counterparts. Depending on the jurisdiction, the more stringent standard would apply.

The following subsections summarize the general regulatory authority governing PFAS in drinking water and groundwater.

Disclaimer: This publication is a collaborative effort to try to set forth best suggested practices on this topic but science is always evolving, and individual situations and local conditions may vary, so members and others utilizing this publication are free to adopt differing standards and approaches as they see fit based on an independent analysis of such factors. This publication is provided for informational purposes only, so members and others utilizing this publication are encouraged, as appropriate, to conduct an independent analysis of these issues. The NGWA does not purport to have conducted a definitive analysis on the topic described in this publication, and it assumes no duty, liability or responsibility for the contents or use of the publication.

Federal System

TSCA

In 2002, EPA issued two Significant New Use Rules (SNURs) under TSCA that restricted the use of 88 PFOS-related chemicals.¹ The SNURs allowed only three specific uses of PFOS: photographic and imaging industries, semiconductor manufacturing, and aviation uses. In 2007, EPA expanded the SNURs to include 183 PFAS chemicals with exceptions allowed for use as an etchant and metal plating and finishing uses.² EPA proposed to amend these SNURs in 2015 to remove certain exemptions for importation of certain PFAS chemicals.³

CERCLA

In January 2009, after the EPA Office of Water issued the provisional health advisory (PHA) for PFOA and PFOS, the EPA Office of Solid Waste and Emergency Response issued a memorandum: "The Toxicity of PFOA and PFOS." In that memorandum, subchronic reference doses were developed for use in the Superfund program's risk-based equations to derive removal action levels and/or screening levels for soil and water.⁴

SDWA

The Unregulated Contaminant Monitoring Rule (UCMR) was developed by EPA to evaluate constituents that are likely to be present in drinking water but do not have health-based standards set under the SDWA. EPA establishes a new list of no more than 30 UCMR constituents every five years, primarily based on the Contaminant Candidate List (CCL). The CCL is developed by an agency and state working group using a stepwise prioritization process. First, a broad set of constituents are identified that are potentially present in drinking water. These constituents are further evaluated based on their potential to cause adverse health effects (potency and severity) and their occurrence (prevalence and magnitude). EPA uses the information obtained from this monitoring as the primary source of occurrence and exposure

information to establish potential future regulatory actions for the protection of public health.

The third Unregulated Contaminant Monitoring Rule (UCMR3) was published on May 2, 2012, and required monitoring for 30 contaminants (28 chemicals and two viruses) between 2013 and 2015. The UCMR3 list included six PFAS: perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), perfluorobutanesulfonic acid (PFBS), perfluorohexanesulfonic acid (PFHxS), perfluoroheptanoic acid (PFHpA), and perfluorononanoic acid (PFNA).

For the contaminants on the assessment monitoring list, which include the PFAS, all systems serving more than 10,000 people and a representative sample of 800 public water systems serving 10,000 or fewer people were also selected for monitoring and are required to test for UCMR contaminants. UCMR3 data are available on EPA's website at www.epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule#3.

In 2008, EPA conducted testing of agricultural sites in Alabama where sewage sludge was applied from a wastewater treatment plant that received wastewater from industrial sources, including facilities that manufactured and used PFOA. EPA expanded its testing to include sampling of public drinking water systems. In response to the data it collected, the EPA Office of Water issued a provisional health advisory (PHA) for PFOA of 0.4 parts per billion (ppb) and PFOS of 0.2 ppb.⁵ In May 2016, EPA replaced the 2009 PHA with a new lifetime health advisory (HA) of 70 parts per trillion (ppt) for PFOA and PFOS, applicable to either chemical individually or in combination.⁶ EPA's health advisories provide technical information to state agencies and other public health officials on health effects, analytical methodologies, and treatment technologies associated with drinking water contamination. As noted in the previous definitions, health advisories are informational only and do not represent enforceable regulatory decisions by the EPA or states.

¹ <https://www.gpo.gov/fdsys/pkg/FR-2002-03-11/pdf/02-5746.pdf>, <https://www.gpo.gov/fdsys/pkg/FR-2002-12-09/pdf/02-31011.pdf>

² <https://www.gpo.gov/fdsys/pkg/FR-2007-10-09/pdf/E7-19828.pdf>

³ <https://www.federalregister.gov/documents/2015/01/21/2015-00636/long-chain-perfluoroalkyl-carboxylate-and-perfluoroalkyl-sulfonate-chemical-substances-significant>

⁴ See Perfluorinated Chemicals (PFCs): Perfluorooctanoic Acid (PFOA) & Perfluorooctane Sulfonate (PFOS) – Information Paper, August 2015, page 9 (<https://clu-in.org/download/contaminantfocus/pops/POPs-ASTSWMO-PFCs-2015.pdf>).

⁵ <https://www.epa.gov/sites/production/files/2015-09/documents/pfoa-pfos-provisional.pdf>

⁶ https://www.epa.gov/sites/production/files/2016-06/documents/drinkingwaterhealthadvisories_pfoa_pfos_updated_5.31.16.pdf

State System

In the absence of national regulatory standards, some states have developed their own state-specific regulations and guidelines relative to PFAS in drinking water and groundwater. New Jersey was one of the first states to take any action on PFAS contamination. In 2007, in response to a request by Penns Grove Water Supply Co., the NJDEP Office of Science and Research issued a lifetime health-based guidance level for PFOA of 0.04 ppb, and is now 0.014 ppb.⁷ Since then, states have issued groundwater remediation levels, drinking water source limits, and drinking water guidance levels. Minnesota has also issued fish-consumption advisories for PFOS.⁸

Drinking Water MCL

The most common method states use to regulate drinking water quality is to adopt federal MCLs or to promulgate more stringent state-specific MCLs. These are enforceable standards that define the highest concentration of a contaminant that is allowed in drinking water. These concentrations are generally based on consideration of health risks, technical feasibility of treatment, and cost-benefit analysis that are designed to protect the public against consumption of drinking water contaminants that present a risk to human health.

Groundwater Quality Standards

Some states have approached regulation of PFAS through regulation of groundwater quality standards, which may be different than drinking water MCLs. New Hampshire, for example, established an ambient groundwater quality standard (AGQS) for PFOA and PFOS at EPA's health advisory level, 70 ppt. The AGQS provides the state with the authority to direct site remediation activities related to PFOS and PFOA and also requires public water systems to comply with these standards if the chemicals are found in their sources of drinking water.⁹

Other Approaches

Some states have issued health advisories for fish. Michigan, for example, has issued a "do not eat" advi-

sory for all fish taken from Clarks Marsh and a recommendation that "resident" fish taken from the lower Au Sable River not be eaten due to the presence of perfluorinated chemicals.¹⁰

State Regulatory Summary

Table 6.1 summarizes the status of some state regulation of PFOS and PFOA as of January 1, 2017.¹¹

WATER SYSTEM LIABILITY ISSUES

Liability Theories

In general, the two primary tort theories of liability are negligence and products liability. Negligence is generally defined as the failure to exercise due care toward others, which a reasonable person would do in the circumstances. There are four basic elements to a negligence claim: duty, breach, causation, and harm. Products liability claims are made against a manufacturer or seller of a defective good or product that causes harm. Products liability claims can also be based on a failure to warn of a hazard that the manufacturer knew or should have known about. This section summarizes some of the cases that discuss these liability theories in the context of contaminated drinking water. In addition, some of the defenses that apply to water systems are discussed.

Because tort law is a mix of statute and judicial opinions, the applicability of any statute or court decision may be limited to a particular state or federal district. There are also a limited number of cases involving water system liability for contaminants in the water system, so trends in this area of law can be difficult to discern. This is not intended to be a comprehensive summary of all the cases that describe the liability of water suppliers. Instead, it is a sampling of the reasoning applied by various courts when applying these legal theories.

Negligence

In Green v. Ashland Water Co. (Wisconsin 1898), the water company was sued for damages arising out of a death caused by typhoid fever that originated in the water system. The Wisconsin court decided that

⁷ http://www.state.nj.us/dep/dsr/pfoa_doc.pdf; http://www.nj.gov/dep/watersupply/pdf/pfoa_dwguidance.pdf

⁸ <http://www.health.state.mn.us/divs/eh/fish/eating/mealadvicetables.pdf>

⁹ <http://des.nh.gov/media/pr/2016/20160531-pfoa-standard.htm>

¹⁰ https://www.michigan.gov/documents/mdhhs/General_Questions_from_March_2016_Public_Meeting_Posted_527011_7.pdf

¹¹ The regulatory limits in Table 6.1 should be used for guidance only. Please consult with current law to determine what standards apply in your state.

Table 6.1. Water Criteria

State	PFOS (µg/L)	PFOA (µg/L)	BASIS
AK	0.4	0.4	Groundwater cleanup levels in effect under amendments for 18 AAC 75 — effective January 2017
DE	0.07 (combined)		July 2016 Guidance for Notification under Division of Waste and Hazardous Substances
IL	0.2	0.4	Class I Provisional Groundwater Remediation Objective
ME	0.56	0.13	Augusta, 2016 Groundwater Screening Levels for Resident, MeCDC
MI	0.011	0.42	Rule 57 Water Quality Rule—Human Noncancer Values for Drinking Water. Also have groundwater-surface water interface protection criteria.
MN	0.027	0.035	HRLs developed in 2009, and revised in 2017, also have fish criteria.
NC	—	2	Interim Maximum Allowable Concentration (IMAC) in groundwater of 2 µg/L developed in 2006. A value of 1 µg/L was proposed but not accepted.
NH	0.07 (combined)		Ambient GW Quality Standards and Public Water System DW — Emergency Rule — May 2016.
NJ	—	0.014	Proposed value for state health-based MCL
NV	—	—	PFBS-DEP Basic Comparison Level for cleanup-residential water
OR	300	24	Not really DW criteria — Oregon Department of Health Initiation Levels for POPs-NPDES and water pollution control facilities. It pertains to facilities with one million gallons a day or more. They are required to sample effluent for various POPs, including PFCs, and if they exceed, they have to implement a reduction plan.
VT	0.02 (combined)		Vermont Health Advisory published in 2016 only for PFOA. Also adopted as Interim Groundwater Quality Standard.
TX	0.56	0.29	Protective Concentration Levels (PCLs) for Texas Risk Reduction cleanup program. Criteria available for 14 other PFCs — March 2016

the applicable rule is *caveat emptor* or “let the buyer beware.” Given the age of the case and the development of products liability and negligence law that has developed since this case, while it is interesting, it may not have much substantive value as precedent.

In another case involving typhoid fever, *Hayes v. Torrington Water Co.* (Connecticut 1914), the plaintiff contracted typhoid fever from the water supply. Although the court noted that the supplier of water is not a guarantor of the purity of its water, it is bound to use reasonable care in ascertaining whether there is a reasonable probability that its water supply may be infected. If the exercise of such care would have disclosed a reasonable probability of disease, then it becomes the duty of a water company to adopt whatever approved precautionary measures are, under the circumstances, reasonably proper and necessary to protect the community it serves from the risk of infection. Thus, the Connecticut court took a much

different view of the duty of a water system than did the Wisconsin court. Again, this too is a very old case and may ultimately not hold much precedential value in Connecticut.

The court in *Coast Laundry Inc. v. Lincoln City* (Oregon 1972) took a view similar to the Connecticut court. The plaintiff was a laundry business that claimed it suffered damage because the city supplied water that contained particles of tar. The Connecticut court said that the municipality, which supplied water for a charge to its inhabitants, is not an insurer or guarantor of quality water. As such, it is not liable for injuries resulting from impure water unless it knew or ought to have known of the impurity, but it will be held liable for illness or epidemic resulting from negligently permitting its water supply to become contaminated or polluted. As such, the water system has a duty to exercise reasonable care and diligence in furnishing an adequate supply of water.

Products Liability

In *Adel v. Greensprings of VT* (363 F.Supp.2d 692, D. VT 2005), the plaintiff was diagnosed as suffering from Legionnaires' disease resulting from consuming water at a condominium. The defendant was a privately owned water system regulated by the state of Vermont as a public system. The plaintiff's lawsuit sought to hold the water system strictly liable under a theory of a breach of the warranty of merchantability. This is a claim that is brought when a product—or "good"—has a hidden defect and does not meet the standards for that product. The water system argued it provided a service and did not sell a product.

The *Adel* court considered decisions in other jurisdictions and concluded that the water suppliers were "sellers" of "goods" consistent with the majority of other courts. The court also found that water suppliers could be held liable for a breach of the warranty of merchantability, although the court noted that courts around the country are split on that issue.

Defenses to Liability

Governmental immunity

Governmental immunity is distinct from sovereign immunity, which applies to states and state agencies but does not extend to municipalities. When applying governmental immunity, courts have recognized that municipal corporations possess a dual capacity, sometimes acting in a governmental capacity, which is protected by governmental immunity, and other times in a private, corporate, or proprietary capacity, which is not protected. Most states have passed tort-claim statutes that replace general common-law governmental immunity with a list of specific immunities, some of which continue to differentiate on the basis of governmental vs. proprietary action.

Safe harbor statutes

Although uncommon, some states have passed statutes that expressly provide water systems with safe harbors from tort liability if the supplier is not in significant noncompliance with drinking water standards. In Ohio, for example, a water supplier that operates a public water system is not liable for injury, death, or loss to person or property if:

- During the period of time the water supplier supplies water to the person, the water supplied by the water supplier meets all applicable drinking water standards.
- The water supplier has not been found to be in significant noncompliance with drinking water standards.
- The injury, death, or loss to person or property is alleged to be caused by a substance for which drinking water standards have been established. (O.R.S.A. Title 61 §6109.35)

In Arizona, the legislature enacted a statute that set the legal standard for water that is "reasonably safe and fit for consumption" if it complies with the more stringent maximum contaminant levels that are established under federal or Arizona's drinking water acts. (Arizona Rev. Stat. Ann. § 12-820.08)