Groundwater 02L PFAS Standards Update and Overview of PFAS Interim Maximum Allowable Concentrations (IMACs)

February 2025 NCMA Water Quality Workshop

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Groundwater 02L PFAS Standards Update

Groundwater Quality Standards Rule

Title 15A NCAC Subchapter 02L – Groundwater Classifications and Standards

Section .0100: General Considerations

Section .0200: Classifications and Groundwater Quality Standards

.0201 Groundwater Classifications

.0202 Groundwater Quality Standards

North Carolina Groundwater Quality Standards

NC Groundwater Quality Standards	
Federal Requirement	No*
North Carolina Rule	15A NCAC 02L .0202
Population	Human Adults
Target use	Ingestion Household use
Standard endpoints	Noncancer Cancer Aqueous taste and odor

*Groundwater standards are used in Federal programs in NC (such as Superfund, RCRA, etc.)

- Maximum allowable concentrations which may be tolerated without creating a threat to human health or which would otherwise render the groundwater unsuitable for its intended best usage
- Best Usage: existing or potential source of drinking water supply for humans
- Protect groundwaters of the state as a resource for human consumption
  - Groundwater supports approximately 50% of drinking water use in the state
- Implemented in various programs including site clean-ups, risk assessments, health evaluations, etc.

Developing Groundwater Quality Standards

Established as the least of the following*:

1. Systemic/non-cancer threshold concentration
2. Concentration which corresponds to an incremental lifetime cancer risk of 1×10^{-6} (one in a million)
3. Taste threshold limit value
4. Odor threshold limit value
5. Maximum contaminant level
6. National secondary drinking water standard

*15A NCAC 02L .0202 (d)

Developing Groundwater Quality Standards cont.

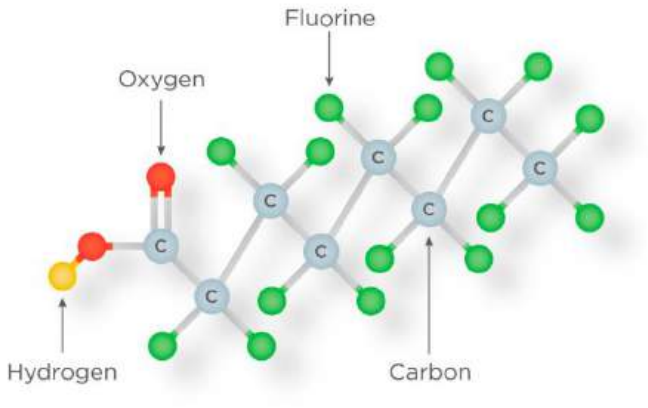
The following references are used, in order of preference*:

1. EPA Integrated Risk Information System (IRIS)
2. EPA Drinking Water Health Advisories
3. Other EPA health risk assessment data
4. Other relevant, published health risk assessment data and scientifically valid peer-reviewed published toxicological data

*15A NCAC 02L .0202 (e)

Per- and Polyfluorinated Substances (PFAS)

- PFAS are a group of manufactured chemicals that are used to make fluoropolymer coatings and products
- Perfluorinated compounds are chemicals of specific concern to North Carolina
  - Widely produced and used; significant presence in NC
  - Persist in the environment
  - Bioaccumulate in humans, animals, and the environment
- Evaluated the available scientific data to develop groundwater standards for a subset of PFAS compounds



Proposed Groundwater Standards for PFAS Compounds

	Compound	Reference	Toxicity Benchmarks and Values Available[+]	Proposed 02L Standard (ng/L)
1	PFOS	2023 EPA Toxicity Assessment[^]	**RfD**, CSF, MCL	0.7*
2	PFOA	2023 EPA Toxicity Assessment[^]	RfD, **CSF**, MCL	0.001*
3	HFPO-DA (GenX)	2021 EPA Human Health Toxicity Assessment[^]	RfD, **MCL**	10

^Used as basis for EPA's PFAS National Primary Drinking Water Regulation
[+]RfD: reference dose; CSF: cancer slope factor; MCL: Maximum Contaminant Level in drinking water
*The proposed standards for PFOA and PFOS are below the EPA reported practical quantitation limit (PQL)

More information on the derivation of the standards is available in the Appendix of the Regulatory Impact Analysis: https://www.deq.nc.gov/accessdeq/rules-regulations/deq-proposed-rules

Regulatory Impact Analysis – Summary

- Overall conclusions of the Regulatory Impact Analysis (RIA):
  - Potential for future savings to state government staff time that can be used at other sites.
  - No additional costs to the regulated community.
  - Potential for future cost savings at sites as a result of the proposed amendments.
  - Potential savings at just one site could be a substantial economic impact.
  - Benefit of regulatory certainty and clarification.
- The RIA was approved by the Office of State Budget and Management on May 22, 2024, with revisions approved on August 14, 2024.

Regulatory Impact Analysis is available online:
https://www.deq.nc.gov/accessdeq/rules-regulations/deq-proposed-rules

Current Rulemaking Status and Anticipated Schedule

Action / Responsibility	Date
Stakeholder Meetings	January and February 2024
GWWMC/EMC Information Item Presentations	May and July 2022; July and November 2023; and January, March, and May 2024
GWWMC – Decision to revise RIA to include only PFOA, PFOS, and GenX and return to GWWMC	July 10, 2024
GWWMC – Decision to Approve Rule Text and RIA to go to EMC	September 12, 2024
EMC – Decision to Approve Rule and RIA for Public Comment	September 13, 2024
Public Comment Period and Hearings	November 1, 2024 – December 31, 2024
EMC – Decision to Approve Hearing Officer's Report and final RIA, Adopt Rule	**May 2025**
RRC – Approval of Rule	June 2025
Proposed effective date, if approved	July 2025

Overview of PFAS Interim Maximum Allowable Concentrations (IMACs)

Interim Maximum Allowable Concentrations

- When a groundwater standard has not been established under the rule for a substance, that substance is not permitted in concentrations above the practical quantitation limit (PQL)
- Any person may request the DWR Director to modify the above requirement by establishing an Interim Maximum Allowable Concentration (IMAC)
- Any person may also request the DWR Director update or remove an existing IMAC

15A NCAC 02L .0202 (c)

Guidelines for IMAC Establishment

- The requestor must submit relevant toxicological and epidemiological data, study results, and calculations necessary to establish an IMAC in accordance with Paragraphs (d) and (e) in 02L .0202.
- DWR evaluates the request and reviews the information to calculate the health-based protective level(s) for the chemical of concern
- DWR provides public notice and opportunity for comment at least 30 days prior to final action

15A NCAC 02L .0202 (c)

Comparison of Groundwater Standards and IMACs

	Groundwater Standards	IMACs
Time-frame	Permanent	Temporary
Regulatory Framework	15 NCAC 02L .0202	15 NCAC 02L .0202
Scientific Review Process	DPH/DWM secondary review	DPH/DWM secondary review
Public Comment	Yes	Yes (opportunity for comment)
Public Hearing	Yes	No
Fiscal Analysis	Yes	No
Public Notification of Value	Yes (NC Register and Rule)	Yes (Public notice and emailed to interested parties)
Legally Enforceable	Yes	Yes
Approval Process	Environmental Management Commission	Division of Water Resources Director

IMAC Request

- DWR received a request to develop IMACs in groundwater for eight per- and polyfluoroalkyl substances (PFAS) on July 22, 2024, along with supporting data and documents.
- DWR public noticed the Director's intent to establish these eight IMACs on September 4, 2024.
  - No revisions to the proposed IMAC values included in the public notice were recommended as a result of the public comments received
- The IMACs for eight PFAS were established by the DWR Director on October 15, 2024.

IMACs Established for Groundwaters effective October 15, 2024

	Substance	Acronym	Concentration (ng/L)
1	Perfluorooctane sulfonic acid	PFOS	0.7
2	Perfluorooctanoic acid	PFOA	0.001
3	Hexafluoropropylene oxide dimer acid	HFPO-DA (GenX)	10
4	Perfluorobutane sulfonic acid	PFBS	2,000
5	Perfluorononanoic acid	PFNA	10
6	Perfluorohexane sulfonic acid	PFHxS	10
7	Perfluorobutanoic acid	PFBA	7,000
8	Perfluorohexanoic acid	PFHxA	4,000

Supporting information for the establishment of these IMACs is available online:
https://www.deq.nc.gov/groundwater-imacs

Next Steps for the PFAS IMACs

- Within 12 months of establishing an IMAC, the DWR Director shall make a recommendation to the EMC whether:
  - A new groundwater standard in place of the IMAC should be established
  - The IMAC should expire
- After the DWR Director's recommendation, the EMC shall decide whether to initiate rulemaking
  - If the EMC initiates rulemaking, then the IMAC remains in effect until the standard is adopted or the EMC declines to adopt a new standard
  - If the EMC declines to initiate rulemaking, the IMAC expires

15A NCAC 02L .0202 (c)(6)

Thank you!

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DWR, Classifications and Standards Branch:
https://deq.nc.gov/about/divisions/water-resources/planning/classification-standards