# Significant Legislative Rule Analysis

Selected Sections in Chapter 246-290 WAC
Group A Public Water Supplies

**Department of Health**
**August 4, 2021**

## Section 1: Describe the proposed rule, including a brief history of the issue, and explain why the proposed rule is needed.

### Background

More than 6.2 million Washington residents get their drinking water from Group A public water systems (Group A water systems). In Washington State, the State Board of Health (board) regulates Group A water systems under Revised Code of Washington (RCW) 43.20.050.

Under RCW 70A.125.080, the Washington State Department of Health (department) is directed to administer a Group A drinking water program with at least the elements necessary to assume primary enforcement responsibility of the federal Safe Drinking Water Act.

The department administers the Group A drinking water program and regulates Group A water systems with a formal agreement with the U.S. Environmental Protection Agency ((EPA) known as "primacy". The department's other authorities to regulate Group A water systems come from state laws, like those mentioned above, and Washington Administrative Code (WAC), like the Group A public water supplies rule, chapter 246-290 WAC, which the board is proposing to amend at this time. The department and the board work closely on rulemaking projects, with the department providing expertise, resources, and recommendations to the board. Ultimately, it is the board that has the authority to adopt the proposed changes in this rule.

The board accepted a petition from Toxic Free Future and nine other organizations on October 11, 2017, to set drinking water standards for per- and polyfluoroalkyl substances (PFAS) in chapter 246-290 WAC.

PFAS are chemicals that have been used in industry and consumer products such as carpeting, apparels, upholstery, food paper wrappings, fire-fighting foams, and metal plating worldwide since the 1950s. Wide use combined with their persistent and bioaccumulative properties have led to widespread detection of perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), perfluorohexane sulfonic acid (PFHxS), and perfluorononanoic acid (PFNA) in the blood serum of the general U.S. population [1]. Average serum levels of PFAS may be more than 100 times higher than national norms in communities exposed via contaminated drinking water[2]. A recent Center for Disease Control (CDC)/ Agency for Toxic Substances and Disease Registry (ATSDR) study in the community of Airway Heights, Washington showed that study participants had mean serum levels of PFHxS that were 60 times higher than national norms even two years after PFAS contamination had been fully mitigated in their community drinking water[3]. Mean serum levels of PFOS and PFOA in participant's serum were 10 and six times higher than national norms, respectively.

Health concerns about PFAS stem from the wide range of adverse effects observed in animal testing. Effects of the best studied PFAS include liver, kidney, thyroid and immune toxicity; developmental and reproductive toxicity, hormone disruption and tumors in certain organs like the liver[4]. The specific profile of effects and the weight of evidence varies by the PFAS examined.

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[1] CDC - NHANES, Fourth Report on Human Exposure to Environmental Chemicals, Updated Tables, (January 2019), C.f.D.C.a. Prevention, Editor. 2019, U.S. Department of Health and Human Services, Centers for Disease Control and Prevention: Atlanta, GA.

[2] Frisbee, S.J., et al., *Perfluorooctanoic acid, perfluorooctanesulfonate, and serum lipids in children and adolescents: results from the C8 Health Project.* Arch Pediatr Adolesc Med, 2010. **164**(9): p. 860-9; Li, Y., et al., *Half-lives of PFOS, PFHxS and PFOA after end of exposure to contaminated drinking water.* Occup Environ Med, 2018. **75**(1): p. 46-51; Pitter, G., et al., *Serum Levels of Perfluoroalkyl Substances (PFAS) in Adolescents and Young Adults Exposed to Contaminated Drinking Water in the Veneto Region, Italy: A Cross-Sectional Study Based on a Health Surveillance Program.* Environ Health Perspect, 2020. **128**(2): doi.org/10.1289/EHP5337.

[3] CDC/ATSDR PFAS Exposure Assessment Community Level Results for Spokane County (WA) near Fairchild Air Force Base, 2020 https://www.atsdr.cdc.gov/pfas/communities/factsheet/Spokane-County-Community-Level-Results-Factsheet.html

[4] Agency for Toxic Substances and Disease Registry (ATSDR), Toxicological Profile for Perfluoroalkyls May 2021, U.S. Department of Health and Human Services: Atlanta. p 993 https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf; EPA, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)*. 2016, Environmental Protection Agency: Washington, D.C. p. 103; EPA, *Drinking Water Health Advisory of Perfluoroctane Sulfonate (PFOS)*, O.o. Water, Editor. 2016, Environmental Protection Agency; U.S. EPA. Human Health Toxicity Values for Perfluorobutane Sulfonic Acid and Related Compound Potassium Perfluorobutane Sulfonate. U.S.

Health researchers are still learning about how environmental exposure to PFAS might affect people's health. The strongest evidence from epidemiology indicates that some PFAS may increase serum cholesterol levels[5], alter liver enzyme levels[6], slightly lower birth weights[7], and reduce immune response to childhood vaccines[8]. Outcomes with more limited evidence of an association with PFAS exposure include thyroid disease, hypertension disorders during pregnancy, reproductive problems, altered hormone levels, and metabolic issues[9]. There is some evidence from occupational and non-occupational studies that PFOA may increase rates of kidney and testicular cancer[10]. Little health data are available for other PFAS.

Starting in 2002, PFAS have been detected in U.S. drinking water, primarily near manufacturing facilities, local fire departments, military bases and airports. Between 2013 and 2015, EPA required a representative number of Group A water systems to measure for six PFAS as part of the third Unregulated Contaminant Monitoring Rule (UCMR 3)[11].

In Washington State, this UCMR 3 sampling included 132 water systems representing 94 percent of people served by Group A water systems. Additionally, voluntary testing by the Navy, Air Force, and Army has discovered additional drinking water contamination in private and public wells on or around four military bases between 2016 and 2020. Proactive testing by nearby public water systems has discovered additional wells that are impacted.

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Environmental Protection Agency, Washington, DC, EPA/600/R-20/345F, 2021; National Toxicology Program (NTP), NTP Technical Report on the Toxicity Studies of Perfluoroalkyl Sulfonates (Perfluorobutane Sulfonic Acid, Perfluorohexane Sulfonate Potassium Salt, and Perfluorooctane Sulfonic Acid) Administered by Gavage to Sprague Dawley Rats P.H. Service, Editor. 2019, U.S. Department of Health and Human Services: Research Triangle Park, NC; National Toxicology Program (NTP), NTP Technical Report on the Toxicity Studies of Perfluoroalkyl Carboxylates (Perfluorohexanoic Acid, Perfluorooctanoic Acid, Perfluorononanoic Acid, and Perfluorodecanoic Acid) Administered by Gavage to Sprague Dawley Rats P.H. Service, Editor. 2019, U.S. Department of Health and Human Services: Research Triangle park, NC; NJDWQI, Health-based Maximum Contaminant Level Support Document: Perfluorononanoic acid (PFNA) 2015, New Jersey Drinking Water Quality Institute Health Effects Subcommittee.

[5] Frisbee, S.J., et al., Perfluorooctanoic acid, perfluorooctanesulfonate, and serum lipids in children and adolescents: results from the C8 Health Project. Arch Pediatr Adolesc Med, 2010. 164(9): p. 860-9; Graber, J.M., et al., Per and polyfluoroalkyl substances (PFAS) blood levels after contamination of a community water supply and comparison with 2013-2014 NHANES. J Expo Sci Environ Epidemiol, 2019. 29(2): p. 172-182; Li, Y., et al., Associations between perfluoroalkyl substances and serum lipids in a Swedish adult population with contaminated drinking water. Environ Health, 2020. 19(1): p. 33.

[6] Bassler, J., et al., *Environmental perfluoroalkyl acid exposures are associated with liver disease characterized by apoptosis and altered serum adipocytokines.* Environ Pollut, 2019. **247**: p. 1055-1063; Salihovic, S., et al., *Changes in markers of liver function in relation to changes in perfluoroalkyl substances - A longitudinal study.* Environ Int, 2018. **117**: p. 196-203; Salihovic, S., et al., *Changes in markers of liver function in relation to changes in perfluoroalkyl substances - A longitudinal study.* Environ Int, 2018. **117**: p. 196-203; Gallo, V., et al., Serum perfluorooctanoate (PFOA) and perfluorooctane sulfonate (PFOS) concentrations and liver function biomarkers in a population with elevated PFOA exposure. Environ Health Perspect, 2012. 120(5): p. 655-60.

[7] Johnson, P.I., et al., The Navigation Guide - evidence-based medicine meets environmental health: systematic review of human evidence for PFOA effects on fetal growth. Environ Health Perspect, 2014. 122(10): p. 1028-39; Meng, Q., et al., Prenatal Exposure to Perfluoroalkyl Substances and Birth Outcomes; An Updated Analysis from the Danish National Birth Cohort. Int J Environ Res Public Health, 2018. 15(9); Wikstrom, S., et al., Maternal serum levels of perfluoroalkyl substances in early pregnancy and offspring birth weight. Pediatr Res, 2019.

[8] National Toxicology Program (NTP), Systematic Review of Immunotoxicity Associated with Exposure to Perfluorooctanoic acid (PFOA) or Perfluoroctane Sulfonate (PFOS). 2016, National Toxicology Program, U.S. Department of Health and Human Services; DeWitt, J.C., S.J. Blossom, and L.A. Schaider, Exposure to per-fluoroalkyl and polyfluoroalkyl substances leads to immunotoxicity: epidemiological and toxicological evidence. J Expo Sci Environ Epidemiol, 2019. 29(2): p. 148-156; Grandjean, P., et al., Serum Vaccine Antibody Concentrations in Adolescents Exposed to Perfluorinated Compounds. Environ Health Perspect, 2017. 125(7): p. 077018; Abraham, K., et al., Internal exposure to perfluoroalkyl substances (PFASs) and biological markers in 101 healthy 1-year-old children: associations between levels of perfluorooctanoic acid (PFOA) and vaccine response. Arch Toxicol, 2020; Timmermann, C.A.G., et al., Serum Perfluoroalkyl Substances, Vaccine Responses, and Morbidity in a Cohort of Guinea-Bissau Children. 2020. 128(8): p. 087002.

[9] Fenton, S.E., et al., Per- and Polyfluoroalkyl Substance Toxicity and Human Health Review: Current State of Knowledge and Strategies for Informing Future Research. Environ Toxicol Chem, 2021. 40(3): p. 606-630; C8 Science Panel. *C8 Probable Link Reports*. 2012 11/28/2013; Available from: http://www.c8sciencepanel.org/prob_link.html.

[10] IARC, Some Chemicals Used as Solvents and in Polymer Manufacture, in IARC Monographs on the Identification of Carcinogenic Hazards to Humans. Volume 110. 2017, International Agency for Research on Cancer (IARC): Lyon, France; Shearer, J.J., et al., *Serum concentrations of per- and polyfluoroalkyl substances and risk of renal cell carcinoma.* J Natl Cancer Inst, 2020.

[11] EPAs UCMR 3 Webpage: https://www.epa.gov/dwucmr/third-unregulated-contaminant-monitoring-rule

PFAS have been identified in drinking water in Issaquah and in private wells and public water systems at or near four military bases: Naval Air Station (NAS) Whidbey Island, Fairchild Air Force Base, Joint Base Lewis-McChord, and Navy Base Kitsap-Bangor. In each area, the sum of PFOA and PFOS in at least one drinking water well exceeded the lifetime health advisory level (HAL) of 70 parts per trillion (ppt) set by the EPA in May 2016. PFAS-based firefighting foam is the suspected source of contamination at all these areas. Ongoing investigations may identify other contributing sources.

In Washington, while we know PFAS have been identified in multiple areas, we do not yet know the full extent of PFAS contamination in our drinking water supplies, and the science around PFAS is evolving quickly. In light of this, several Group A water systems have either installed treatment to reduce PFAS or are pursuing treatment.

## What does the rule require?

In this rulemaking, the board and the department considered setting a state Maximum Contaminant Level (MCL) for PFAS but ultimately the board directed the department to develop a "state advisory level", which is undergoing a concurrent name change in this proposal to "state action level (SAL)."

The proposal establishes SALs for five PFAS contaminants—PFOA, PFOS, PFHxS, PFNA, and PFBS (perfluorobutane sulfonic acid). The proposed rule requires Group A community and nontransient noncommunity (NTNC) public water systems[12] to test for PFAS. These Group A water systems will be required (at minimum) to take one sample every three years—for each active and permanent or seasonal source—to determine if the drinking water is contaminated with PFAS.

It should be noted that transient noncommunity (TNC) Group A water systems[13] that are near a known or suspected area of PFAS contamination may also be required to sample for PFAS under the proposed rule.

For those Group A water systems that have detections of PFAS, but do not exceed the SAL, the proposed rule requires additional ongoing monitoring, with the frequency of monitoring based upon the detected level in comparison to the SAL. It also establishes reporting, recordkeeping, and consumer confidence report (CCR) requirements.

For those Group A water systems that exceed the SAL, the rule sets follow-up actions such as monitoring, public notification (PN), and additional recordkeeping and reporting requirements. There may be individual situations where a water system's PFAS results are very high and pose an immediate public health threat. In those unique situations the department, the water system, and the local health jurisdiction will work together to take actions to protect public health, as they would in the event of any known or unknown contaminant. If supported by the facts and emerging science, the local health officer and/or the department may order a water system to take action to remedy a public health emergency under its general authority to regulate drinking water systems, including RCW 70A.125.030(1); RCW 70.05.070; RCW 43.70.130(7). This would be a case-by-case decision, not a requirement of general application under this rule.

## Why are the changes to the rule needed?

This proposed rule change is needed to protect public health from an unregulated contaminant in Washington State drinking water.

Monitoring for these proposed contaminants will help us identify PFAS contamination in Group A water systems across our state. The proposed rule establishes PN requirements to inform drinking water consumers if

[12] For explanation of what constitutes Group A community and nontransient noncommunity (NTNC), and TNC public water systems see https://apps.leg.wa.gov/wac/default.aspx?cite=246-290-020

[13] Ibid. footnote 12, this page.

levels of PFAS in their drinking water exceed a SAL. The proposed rule will help us better understand the extent of PFAS contamination across our state.

Michigan, a state that has done comprehensive testing[14], found contamination sites that were not located near any obvious PFAS release site. Because we still don't know about all the different uses of PFAS or the industrial users of PFAS, testing based on proximity to a known release site will not be comprehensive enough. Finding PFAS in drinking water supplies led Michigan to seek and find local release sites that could be mitigated. Mitigating a source will benefit the drinking water supply, and consumers of that supply, over the long term.

One example is that contamination of PFAS in the Ann Arbor water system led to discovery of a chrome plating company that was discharging PFOS to a tributary upstream[15]. The local government required the company to install pretreatment to remove the PFOS from its discharge. That not only benefitted the water system but also fish and wildlife that share the river.

PFAS are odorless and tasteless so the only way to know if they are in your water system is to test for them. PFAS contamination of groundwater is likely to be a localized problem. Initial testing and then every three years thereafter across our state of Group A systems will help us find impacted drinking water supplies and notify other nearby private and Group B wells that they may want to test [16]. It will start the process of finding and mitigating local sources.

Should PFAS results be very high in a community, then the department and the local health officer would work to support them in our shared mission to protect public health—just as we would in any other public health emergency.

A key part of this assistance would be in risk communications to help the utility and its customers discuss next steps. These discussions will likely lead to choices these communities will have to make to protect public health and safety and address the PFAS contamination in their drinking water supplies. This is a mission we all share.

The department is working with the Department of Ecology (Ecology), to develop a Per- and Polyfluoroalkyl Substances Chemical Action Plan (PFAS CAP)[17]. The proposed PFAS SALs lay the foundation for Ecology to establish clean-up standards for PFAS. The draft PFAS CAP[18] makes several recommendations that would support Group A water systems in addressing PFAS contamination when and if it is discovered upon implementation of these proposed amendments.

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## Section 2: Is a Significant Analysis required for this rule?

Yes, as defined in RCW 34.05.328, portions of the proposed rule require a significant analysis. The proposed revisions establish monitoring, PN, reporting, recordkeeping, and CCR requirements for PFAS.

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[14] Michigan water testing resting results: https://www.michigan.gov/pfasresponse/0,9038,7-365-95571_95577_95587---,00.html

[15] MI investigation of Ann Harbor water - https://www.michigan.gov/pfasresponse/0,9038,7-365-86511_95792_95795---,00.html and https://www.wixomgov.org/Home/ShowDocument?id=7721

[16] A Group B water system is a public water system that does not meet the definition of a Group A water system. (See Table 1 under WAC 246-290-020 and chapter 246-291 WAC for further explanation of a Group B water system.) Group B water systems are regulated by local health jurisdictions under a joint plan of responsibility.

[17] A CAP identifies, characterizes, and evaluates uses and releases of a specific Persistent Bioaccumulative Toxin (PBT), a group of PBTs, or metals of concern, and recommends actions to protect human health or the environment.

[18] Department of Ecology, PFAS CAP Publication 20-04-035 https://apps.ecology.wa.gov/publications/SummaryPages/1810001.html

The department determined the proposed revisions include some significant legislative rule sections that are subject to the requirements of RCW 34.05.328(5). The proposed revisions include new sections and changes to existing sections.

This analysis evaluates each of the 28 new and amended rule sections to determine whether the changes in each section are "significant" or "non-significant."

The following table identifies 17 rule sections or portions of rule sections the department has determined are exempt from analysis based on the exemptions provided in RCW 34.05.328(5) (b) and (c):

**Table 1: Sections determined to be non-significant**

| WAC Section and Title | Description of Proposed Changes | Rationale for Exemption Determination |
|---|---|---|
| **WAC 246-290-001 Purpose and scope.** | Technical correction to align RCW references from Title 70 to 70A per a legislative change (SHB2246) in 2020. | Incorporates by reference without material change a Washington state statute. |
| **WAC 246-290-010 Definitions abbreviations, and acronyms.** | Definitions added where necessary and modified to be consistent with changes throughout the chapter. | The impact of definition changes are analyzed in the context they are used throughout the rule sections. |
| **WAC 246-290-050 Enforcement** | Technical correction to align RCW references from Title 70 to 70A per a legislative change (SHB2246) in 2020. | Incorporates by reference without material change a Washington state statute. |
| **WAC 246-290-100 Water system plan.** | Technical correction to align RCW references from Title 70 to 70A per a legislative change (SHB2246) in 2020. Changed "shall" to "must" per the bill drafting guide. | Incorporates by reference without material change a Washington state statute. Clarifies language of the rule without changing its effect. |
| **WAC 246-290-107 Place of use expansion** | Technical correction to align RCW references from Title 70 to 70A per a legislative change (SHB2246) in 2020. | Incorporates by reference without material change a Washington state statute. |
| **WAC 246-290-415 Operations and maintenance.** | Technical correction to align RCW references from Title 70 to 70A per a legislative change (SHB2246) in 2020.<br>Several editorial changes to clarify requirements, | Incorporates by reference without material change a Washington state statute. Clarifies language of the rule without changing its effect. |
| **WAC 246-290-453 Corrective action under the GWR.** | Technical correction to remove outdated WAC references. | Clarifies language of the rule without changing its effect. |
| **WAC 246-290-490 Cross-connection control.** | Technical correction to align the table numbers in the chapter. Several editorial changes to clarify requirements. | Clarifies language of the rule without changing its effect. |
| **WAC 246-290-630 General requirements.** | Technical correction to align RCW references from Title 70 to 70A per a legislative change (SHB2246) in 2020.<br>Several editorial changes to clarify requirements. | Incorporates by reference without material change a Washington state statute. Clarifies language of the rule without changing its effect. |

| WAC Section and Title | Description of Proposed Changes | Rationale for Exemption Determination |
|---|---|---|
| **WAC 246-290-638 Analytical requirements.** | Technical correction to align the section with federal requirements. Several editorial changes to clarify requirements. | Clarifies language of the rule without changing its effect. |
| **WAC 246-290-654 Treatment criteria for filtered systems.** | Technical correction to align the table numbers in the chapter. Several editorial changes to clarify requirements. | Clarifies language of the rule without changing its effect. |
| **WAC 246-290-660 Filtration.** | Technical correction to align the table numbers in the chapter. Several editorial changes to clarify requirements. | Clarifies language of the rule without changing its effect. |
| **WAC 246-290-686 Compliance requirements for unfiltered systems.** | Technical correction to align the table numbers in the chapter. | Clarifies language of the rule without changing its effect. |
| **WAC 246-290-71002 Public notice content.** | Clarification of unregulated contaminants as required per 40 C.F.R 141.40 to align with section WAC 246-290-71005, Special PN requirements. | Clarifies language of the rule without changing its effect. |
| **WAC 246-290-71004 Public notification mandatory language.** | Clarification of unregulated contaminants as required per 40 C.F.R 141.40 to align with section WAC 246-290-71005, Special PN requirements | Clarifies language of the rule without changing its effect. |
| **WAC 246-290-72001 Purpose and applicability of consumer confidence report requirements** | Revised the definition of "detected" to "state detection reporting limit" to align with chapter 246-390 WAC. | Clarifies language of the rule without changing its effect. |
| **WAC 246-290-810 Water use efficiency program.** | Technical correction to align the table numbers in the chapter and added the effective date of the water use efficiency program. | Technical correction to align the table numbers in the chapter. |

The remaining 11 sections are determined to be significant under RCW 34.05.328 (5). The section-by-section analysis in Section 5 evaluates the probable benefits and costs of each section deemed significant.

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## Section 3: Clearly state in detail the general goals and specific objectives of the statute that the rule implements.

The general goal of RCW 43.20.050 is for the board to adopt rules for Group A water supplies to protect public health by ensuring the people of Washington have safe and reliable drinking water. The following are the relevant excerpts from the statute:

RCW 43.20.050(2)(a):

"(2) In order to protect public health, the state board of health shall:

(a) Adopt rules for group A public water systems, as defined in RCW 70A.125.010, necessary to assure safe and reliable public drinking water and to protect the public health. Such rules shall establish requirements regarding:
(i) The design and construction of public water system facilities, including proper sizing of pipes and storage for the number and type of customers;
(ii) Drinking water quality standards, monitoring requirements, and laboratory certification requirements:
(iii) Public water system management and reporting requirements;
(iv) Public water system planning and emergency response requirements;
(v) Public water system operation and maintenance requirements;
(vi) Water quality, reliability, and management of existing but inadequate public water systems; and
(vii) Quality standards for the source or supply, or both source and supply, of water for bottled water plants;"

That law is reinforced by RCW 70A130.010 with additional board authority setting drinking water standards for chemical contaminants.

> "(1) In order to protect public health from chemical contaminants in drinking water, the state board of health shall conduct public hearings and, where technical data allow, establish by rule standards for allowable concentrations. For purposes of this chapter, the words "chemical contaminants" are limited to synthetic organic chemical contaminants and to any other contaminants which in the opinion of the board constitute a threat to public health. If adequate data to support setting of a standard is available, the state board of health shall adopt by rule a maximum contaminant level for water provided to consumers' taps. Standards set for contaminants known to be toxic shall consider both short-term and chronic toxicity. Standards set for contaminants known to be carcinogenic shall be consistent with risk levels established by the state board of health.
>
> (2) The board shall consider the best available scientific information in establishing the standards. The board may review and revise the standards. State and local standards for chemical contaminants may be stricter than the federal standards."

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## Section 4: Explain how the department determined that the rule is needed to achieve these goals and specific objectives. Analyze alternatives to rulemaking and the consequences of not adopting the rule.

The proposal achieves the authorizing statute's goals and objectives by establishing:

- Administrative processes for the setting of drinking water quality standards as SALs and state maximum contaminant levels (MCLs) in rule.
- Drinking water quality standards, as SALs, for five PFAS.
- Requirements for initial monitoring for PFAS and emerging contaminants that are federally unregulated.
- Requirements for additional monitoring, PN, recordkeeping, and reporting when a Group A water system has a detection of PFAS or a federally unregulated contaminant.

The department assessed the current rule chapter, the authorizing statutes, and determined that the proposed rule amendments are needed to achieve the goals and objectives of the statutes noted above.

The five proposed SALs are scientifically based, health protective standards for the most commonly detected PFAS in Washington drinking water with sufficient toxicity information. In the past, these and other unregulated contaminants were handled on a case-by-case basis, by policy, advice, and guidance.

Having the standards in rule provides consistent implementation and transparency to the regulated Group A water systems across the state. This also benefits drinking water customers as they would know there is a health based standard for PFAS, whether or not their drinking water exceeds the health-based standards - or SALs - in this proposal, and they would receive information on how to protect themselves if SALs were exceeded.

In addition to Group A water systems and their consumers knowing more about the water quality, the establishment of the PFAS SALs will result in the state knowing more about the extent, locations, and severity of PFAS contamination across the state, a clear public health benefit as a first step in addressing the sources and health risks associated with PFAS contaminated drinking water.

The proposed rule changes also create a clear framework for how the board may address unregulated contaminants in the future.

There are no feasible alternatives to rulemaking when setting drinking water standards to better protect public health in Washington State.

## Section 5: Explain how the department determined that the probable benefits of the rule are greater than the probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directive of the statute being implemented.

### Survey Methodology Description

The department sent surveys to Group A community and NTNC public water systems that the department had email addresses for in our files. Of the more than 1,000 Group A water systems, including investor owned utilities (IOUs) and satellite management agencies (SMAs) surveyed, 136 responded. The department asked these Group A water systems, IOUs and SMAs (hereinafter referred to as Group A water systems) to estimate the anticipated costs of several actions required in the proposed rule. Table 2 below shows the number of Group A water systems that responded, and the number of connections served.

**Table 2: PWS Size (# of Connections) (136 total respondents/112 provided service connection served)**

| Number of service connections indicated in survey response | Number of Group A water systems |
|---|---|
| Over 100,000 | 2 |
| 10,000-100,000 | 20 |
| 5,000-9,999 | 5 |
| 1,000-4,999 | 19 |
| 100-999 | 32 |
| Less than 100 | 34 |

The number of respondents that provided cost estimates are identified in the section-by-section analysis below. The respondents represent very small to very large Group A water systems and represent all parts of the state. The costs estimated from Group A water systems are discussed in the various sectional analyses below.

## Section-by-section analysis

### WAC 246-290-130 Source approval.

**Description:** This section identifies the minimum criteria and documentation a Group A water system must submit to the department for approval before the Group A water system can begin using a drinking water source. Requirements include determination of the type of source, legal right to use the source, a hydrogeologic assessment of the source and an array of water quality tests that demonstrate the source is safe to use.

The proposed amendments add five PFAS contaminants (PFOA, PFOS, PFHxS, PFNA, PFBS) to the list of contaminants for which a Group A water system must provide sampling results to the department prior to source approval. In addition, a technical correction was made to clarify that bacterial results must be satisfactory.

**Costs:** The additional cost of including PFAS testing in the list of the contaminants that a Group A water system must test for prior to getting source approval–ranges from $300-$829 with an average estimated cost of $553[19]. These costs excluded travel, nominal cost for labor to collect or ship the sample to a certified lab (see analysis of WAC 246-290-300 below for a more detailed discussion on estimated PFAS sampling cost). The department assumes these activities are already required for the other contaminants a Group A water system must test to get a source approved. There are also no additional costs associated with the technical correction regarding bacterial results.

**Benefit:** In order to protect public health, the department requires that new drinking water sources are from the highest quality source feasible. The inclusion of PFAS in source water sampling for source approval will tell us if there is PFAS in a source of drinking water. Four of these PFAS take years to clear the body once absorbed. Identifying new sources with PFAS problems can allow for protective action before people are exposed. It could also provide opportunity to discover additional, or unknown release sites, allowing for source mitigation, which benefits the drinking water supply long term.

### WAC 246-290-300 Monitoring requirements.

**Description:** This section establishes minimum monitoring requirements for active Group A water systems, both for source and distribution system samples. For those Group A water systems that have results that trigger additional monitoring, increased monitoring is identified in WAC 246-290-320.

For community and NTNC Group A water systems, the proposed rule establishes an initial PFAS sample requirement for every active, permanent, or seasonal source to be collected from the entry point to distribution—no later than December 31, 2025—and then once every three years thereafter. The proposed rule includes minimum requirements for samples collected prior to rule January 1, 2023 to be accepted to meet initial monitoring requirements. The proposal also allows the department to develop a future waiver model for PFAS.

The rule proposes that the criteria considered when determining initial monitoring schedules will be based upon source susceptibility, vulnerability to PFAS contamination, and populations served. The proposal also

[19] Results from survey to laboratories that are approved to conduct water quality testing for Group A water systems significant analysis for Laboratory PFAS rule

allows Group A water systems that sample for PFAS under UCMR 5, and meet certain criteria, to satisfy their initial monitoring requirements under this rule proposal.

The proposed rule also allows the department to require confirmation samples for results with detections and explains how the confirmation samples will be used. It directs systems with detections to WAC 246-290-320 for increased monitoring following confirmed detections.

The proposed rule requires TNC systems that are near known or suspected PFAS contamination to collect PFAS samples for analysis as well. If PFAS is detected in the sample, TNC systems must also comply with the follow-up requirements in WAC 246-290-320(8).

The proposed rule makes the following additional amendments:

- Technical changes to clarify sample analysis is performed using EPA-approved methods or other department-approved methods.
- Editorial change to remove a note regarding PN that is addressed in WAC 246-290-71001.
- Deleted several outdated monitoring requirements to align with federal regulations.
- Technical correction that clarifies averaging of samples is based on either location, confirmed detection, or running annual average (RAA) for disinfection byproducts.
- Several minor technical and editorial changes to improve clarity, including changing the term "analytes" to "contaminants" for consistency with federal regulations.
- Includes a monitoring framework for future SALs should they be developed under WAC 246-290-315.

**Costs:** A total of 109 Group A water systems provided costs to collect and ship water quality samples for testing. Table 3 below shows the estimate for one sample from one location. Sample costs include travel time, labor to collect sample, and shipping costs.

**Table 3: Costs to sample and analyze one PFAS Sample**

| Action | Mean cost | High cost | Low cost |
|---|---|---|---|
| Take and analyze one PFAS sample[20] | $796 | $2,386 | $610 |

Table 4 below further shows distribution of the estimated sampling costs.

**Table 4: Costs to sample and analyze one PFAS Sample, Cost Distribution**

| Estimated cost (includes estimated **$600** lab cost for sample analysis) | Number of respondents within range |
|---|---|
| Between $610 and $800 | 74 |
| $801 to $1,000 | 26 |
| $1,001 to $1,200 | 7 |
| $1,201 to $1,400 | 1 |
| Over $1,400 ($2,386) | 1 |

As shown above, most systems (100 out of 109) (92 percent) estimated it would cost between $610 to $1000 to travel, collect, and ship one PFAS sample. This analysis includes the $600 lab cost, which the department initially estimated and asked respondents to include when estimating the total cost of taking and analyzing one sample. Some of the higher estimates indicated higher labor costs per hour or more hours needed to complete sampling.

[20] Cost includes estimated **$600** lab cost for sample analysis. Six survey responses indicated $0 or no cost, which were excluded from the mean, high, or low-cost calculations.

The initial estimate from the department ($600) for taking and analyzing one PFAS sample was further analyzed based on input from labs, which range from $300 to $829, with an average cost of $553. The department did not retrospectively update the initial estimate from the department ($600) to the average cost finding from the analysis ($553) in this section but notes that the analysis potentially overestimates the average cost per PFAS sample in this section by $47.This also applies to the costs for source approval (section analysis of WAC 246-390-130 above)[21].

These costs reflect one sample for one source. To generate a planning level cost estimate for Group A water system's total monitoring cost, multiply these costs[22] by the required number of samples, which will be unknown until after initial and ongoing samples are collected and analyzed. Based on the concentration of PFAS contaminants in the water and other factors, such as blending or treatment, some Group A water systems may have to do additional monitoring (i.e., quarterly, annually, or every three years) as described in the analysis for WAC 246-290-320 below.

**Benefit:** Requiring sampling of all Group A community and NTNC water systems for PFAS, the public will have information important to their health. Those Group A water systems with results below the proposed SALs will have confidence in the drinking water knowing it does not exceed the proposed SALs. Those with PFAS detections in their water above a SAL will benefit from the public notification requirements under WAC 246-290-71006, which will include health effects information and steps they can take to reduce their exposure, so they are able to make informed decisions about their health and the health of their families.

The proposed monitoring standards will help the department, local health jurisdictions, and Group A water systems to better understand the extent of PFAS contamination across our state. Information gained from the data collected under the proposed requirements of this section will drive requirements for notification and other follow-up actions identified in subsequent sections.

The data gathered from Group A community and NTNC water systems will be used to determine which TNC systems may be at risk to PFAS contamination and thus which of these will be required to test for PFAS as well.

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## WAC 246-290-310 Maximum contaminant levels (MCLs) and maximum residual disinfectant levels (MRDLs).

**Description:** This section establishes that Group A water systems are responsible for complying with the water quality standards identified in this section. This section provides the MCLs, MRDLs, secondary MCLs, and lead and copper action levels. Violations of these levels are calculated based on a confirmed detection or a running annual average (RAA).

Proposed amendments to this section replace "state advisory level" with the term "state action level" (SAL) in the new proposed section WAC 246-290-315.

The proposal makes the following technical changes:

- Added a reference to a new rule section concerning SALs and state MCLs under WAC 246-290-315.
- Moved requirements for "other contaminants" into the new section WAC 246-290-315.
- Removed the federally remanded MCL for nickel.

[21] These cost estimates excluded the six survey responses from Group A water systems that indicated no costs.

[22] Economies of scale may be realized when multiplying the cost per sample by the number of sources due to potential savings from combined transportation and shipping costs. The extent of these potential savings is unknown but believed to be negligible.

- Corrected the chemical symbol for cyanide.
- Added the MCLs for volatile organic contaminants (VOCs), which were previously listed by reference under 40 C.F.R. 141.61.
- Added a footnote that refers to WAC 246-290-460 to clarify the fluoridation standards for those Group A water systems that provide community water fluoridation.

**Costs:** There are no anticipated compliance costs associated with the changes to this section. The portion on state advisory levels, which was removed, has no associated costs.

**Benefit:** This section clarifies the difference between contaminants for which EPA has established standards and where the board is proposing state standards as SALs and a process for proposing state MCLs in WAC 246-290-315.

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## WAC 246-290-315 State action levels (SALs) and state maximum contaminant levels (MCLs)

**Description:** This is a new section. The proposed rule removes "state *advisory* level" from WAC 246-290-310 and adds "state *action* level" (SAL) to this new section. This proposed change is to account for and acknowledge the proposed rule now requires actions Group A water systems must take when a SAL is exceeded. Most importantly, this section establishes the following SALs for five PFAS contaminants.

**Table 5: Five Proposed PFAS SALs[23]**

| Contaminant or Group of Contaminants | SAL | SAL Exceedance Based On: |
|---|---|---|
| PFOA | 10 ng/L | Confirmed detection |
| PFOS | 15 ng/L | Confirmed detection |
| PFHxS | 65 ng/L | Confirmed detection |
| PFNA | 9 ng/L | Confirmed detection |
| PFBS | 345 ng/L | Confirmed detection |

The department developed the SALs from health protective values for these five PFAS. Perfluoroalkyl acids, such as PFOS, PFOA, PFNA, PFHxS, and PFBS, are essentially nondegradable by natural processes in the environment and persist in groundwater[24]. Because some PFAS bioaccumulate in the human body, even low levels in drinking water can produce concerning concentrations in the body of consumers. Once in the body, these compounds take years to excrete.

The approach to developing SALs involved evaluating primary PFAS scientific literature and reviewing recent assessments by federal and state agencies. The values were derived from studies in laboratory animals with support from epidemiological data when available. The department found sufficient information to recommend SALs for these five PFAS. For details, see the supporting information for each PFAS SAL[25].

The SALs define a level in daily drinking water expected to be without appreciable health effects even in sensitive populations and life stages. They are comparable to a health advisory level or maximum contaminant level goal (MCLG) in the federal Safe Drinking Water Act.

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[23] Table 9 in proposed WAC 246-290-315

[24] Interstate Technology Regulatory Council (ITRC). Environmental Fate and Transport for Per- and Polyfluoroalkyl Substances. 2019 [cited 2019 July]; Available from: pfas-1.itrcweb.org/wpcontent/uploads/2018/03/pfas_fact_sheet_fate_and_transport__3_16_18.pdf.

[25] Recommended State Action Levels for Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water: Approach, Methods and Supporting Information https://www.doh.wa.gov/Portals/1/Documents/4200/PFASToxicologicalAssessment.pdf

The proposed rule establishes that exceedances of the PFAS SALs are based on a confirmed detection and sets confirmation sample deadlines for contaminants with a SAL. If a contaminant is detected in a sample, the proposed rule requires systems to comply with the follow-up requirements in WAC 246-290-320.

The proposed rule also establishes processes for setting SALs and state MCLs, including adding the criteria the board proposes to use when determining if an unregulated contaminant should have a SAL or state MCL.

Lastly, the proposal clarifies that if a federal MCL is adopted for a contaminant that has a SAL, the federal MCL will supersede the SAL (or a less stringent state MCL) and the associated requirements, including for monitoring and public notice—unless the board adopts a more stringent state MCL.

**Costs:** There are no known or anticipated direct compliance costs associated with the board establishing the SALs in rule. The department further discusses the costs of the associated requirements for monitoring these contaminants and other required actions in their respective sections of this analysis.

The department recognizes that a Group A water system that exceeds a SAL set in this section, may voluntarily choose to mitigate by blending with another source or installing treatment to reduce PFAS contaminants found in their water supplies. Should a Group A water system choose to mitigate despite it not being required, the department would work with that system to determine the most cost-effective path forward to protecting public health as we have done in the past with other contaminants.

For those systems that want to pursue treatment, EPA has developed cost models that include capital and operational costs[26]. Ecology included, for illustrative purposes, some case studies of Group A water systems that have elected to install treatment to remove PFAS in the PFAS CAP[27]. Some of the examples below include investigation costs:

- The City of Issaquah spent $600,000 to install a treatment system on one PFAS-contaminated city well. Filter maintenance and monitoring also require ongoing expenditures of $56,000 per year.
- Treatment of drinking water in Lakewood, using granular activated carbon filtration, is estimated to cost $5.2 million in initial capital costs, with ongoing operating and maintenance costs of $96,000 per year.
- At Joint Base Lewis McChord, McChord Field System, treatment of water from three wells, using granular activated carbon filtration, is estimated to cost $10.3 million in initial capital costs, with ongoing operating and maintenance costs of $830,000 per year.

**Benefit:** The five proposed SALs are scientifically based, health protective standards for the most commonly detected PFAS in Washington drinking water, with sufficient toxicity information. In the past, these and other unregulated contaminants were handled on a case-by-case basis, by policy, advice, and guidance.

Having the standards in rule provides consistent implementation and transparency to the regulated Group A water systems across the state. This also benefits drinking water customers as they would know there is a health-based standard for PFAS and whether their drinking water exceeds the health-based standards - the SALs - in this proposal. Additionally, they would receive information on how to protect themselves if SALs were exceeded.

In addition to Group A water systems and their consumers knowing more about the water quality, the establishment of the PFAS SALs will result in the state knowing more about the extent, locations, and severity of PFAS contamination across the state, a clear public health benefit as a first step in addressing the sources and health risks associated with PFAS contaminated drinking water.

[26] https://www.epa.gov/sdwa/drinking-water-treatment-technology-unit-cost-models
[27] Ibid. footnote 25, this page

All five of these PFAS produce developmental toxicity or effects of developmental concern in laboratory animals. To address developmental concerns, our action levels considered exposure pathways specific to early life stages, including placental and lactational transfer using a model developed by the Minnesota Department of Health[28].

Infants are more highly exposed than older children or adults when PFAS are in community drinking water because infants have the highest rates of intake per pound of body weight. Breastfeeding is also an important indirect route of exposure for breastfed infants when these five PFAS are in drinking water. All may transfer from maternal serum into breastmilk.

Our SALs support breastfeeding and our public health advice[29] to breastfeed exclusively for six months and gradually introduce other sources of nutrition while continuing to nurse until baby is one year old.

Using the Minnesota Department of Health infant model, our SALs keep nursing infants from exceeding our recommended limits for exposure to these PFAS. It is important to protect infants because their rapid development make them vulnerable to chemicals that may reduce thyroid hormone levels, reduce growth and alter development, and impact the immune system.

The development and adoption of these scientifically based SALs will be used by the Department of Ecology (Ecology) to address clean up of PFAS in the environment, including soils and surface water. This will be an important step to addressing the PFAS contaminations across the state.

According to Ecology's draft PFAS CAP, "Ecology will use the board's drinking water standards or other advisories adopted in rule to develop these cleanup levels." The draft PFAS CAP also states that "[O]nce PFAS water contaminants are officially classified as hazardous substances by the federal government or by the state of Washington, they can be addressed under the state Model Toxics Control Act (MTCA) framework." This would allow Group A water systems to pursue mitigation costs from the liable parties[30].

The PFAS toxicology assessment provides supporting information regarding our approach to developing the PFAS SALs. This assessment involved evaluation of the primary PFAS scientific literature and review of recent assessments by federal agencies and several states to support the establishment of the SALs.

While the proposed rule does not automatically require treatment in the event of a SAL exceedance, an action reserved for MCLs, the establishment of SALs for these federally unregulated contaminants will result in the Group A water systems and their consumers knowing more about the safety of their water and reducing people's exposure to these five PFAS chemicals in their drinking water.

The benefits, given the potential for above-mentioned health impacts can qualitatively be assessed as including the reduction in costs for the needed health care treatment for health impacts and possible loss of income. Additionally, one can imagine many associated indirect costs to those secondarily impacted by an illness in one's family or even to an employer who loses the productivity of an employee with an associated illness and those that will need to care for their ill family member

[28] The MDH Model is the Minnesota Department of Health toxicokinetic model for infant intake of bioaccumulative PFAS in drinking water. It includes age-specific drinking water ingestion rates as well as placental and lactational transfer pathways from mother to child.
[29] https://www.doh.wa.gov/YouandYourFamily/Breastfeeding
[30] Department of Ecology, PFAS CAP Publication 20-04-035 https://apps.ecology.wa.gov/publications/SummaryPages/1810001.html

## WAC 246-290-320 Follow-up action.

**Description:** This section establishes increased monitoring requirements for those Group A water systems that have detected results, which trigger additional increased monitoring. It also establishes requirements for notification and other follow-up actions required when a Group A water system exceeds an MCL, MRDL, action level, or a treatment technique (TT) trigger.

The proposed amendments to this section establish actions a Group A water system must take if there is an exceedance of a contaminant's SAL. These proposed amendments are like those for other federally regulated contaminants, including that the Group A water system must notify the department, notify Group A water system users, and owners and operators of any consecutive systems. Group A water systems must also investigate the cause of the contamination, within the Group A water system's control. The investigation may include, but is not limited to:

- Sampling the raw source water to determine if the contamination is in the aquifer or surface water source.
- Sampling to determine if the contamination is a result of a treatment process, sampling conditions, or sampling processes.
- Reviewing quality assurance and quality control data to determine if the contamination is a result of laboratory processes.

Additionally, Group A water systems must take action as directed by the department, for example if the contamination is determined to be within the purveyor's control, the department may:

- Direct a utility to adjust existing treatment if contamination is tied to existing facilities.
- Repair damaged or poorly installed infrastructure such as a poorly installed pitless adapter, if allowing a pathway for contamination.
- Direct a utility to collect additional samples, which might include additional samples from key locations within the distribution after a system has flushed the contaminant out of the system.

For those Group A water systems that exceed the SAL, the rule sets follow-up actions such as monitoring, public notification, and additional recordkeeping and reporting requirements. There may be individual situations where a water system's PFAS results are very high and pose an immediate public health threat. In those unique situations the department, the water system, and the local health jurisdiction will work together to take actions to protect public health, as they would in the event of any known or unregulated contaminant. If supported by the facts and emerging science, the local health officer and/or the department may order a water system to take action to remedy a public health emergency under its general authority to regulate drinking water systems, including RCW 70A.125.030(1); RCW 70.05.070; RCW 43.70.130(7). This would be a case-by-case decision, not a requirement of general application under this rule.
The proposed amendments add monitoring requirements when there is a detection of an organic contaminant with a SAL, since these contaminants are not naturally occurring. For inorganic contaminants, increased monitoring would begin when the SAL is exceeded.

For organic contaminants with a SAL, the designated number of additional consecutive quarters of monitoring required is based on the detected concentration in comparison with a SAL. Sources with lower detections relative to the SAL will have less required monitoring than sources with higher detections relative to a SAL.

See Tables 6 and 7 below for additional monitoring required at different concentrations. Table 6 outlines the number of quarters following the first detection, and Table 7 outlines ongoing monitoring following the increased quarterly monitoring identified in Table 6.

**Table 6: Monitoring Requirements Following the First Detection of An Organic Contaminant with a Sal**

| If the highest detection in the first year is: | Total number of additional consecutive quarters. |
|---|---|
| ≤ 20% of the SAL. | 1 |
| > 20% but < 80% of the SAL. | 2 |
| ≥ 80% of the SAL. | 3 |

**Table 7: Ongoing Monitoring Requirements for Sources with Organic Contaminants with a Sal**

| If highest detection being considered is: | Monitoring frequency: |
|---|---|
| ≤ 20% of the SAL. | Every 3 years |
| > 20% but < 80% of the SAL. | Annually |
| ≥ 80% of the SAL. | 1. Quarterly, if contaminant is a Tier 1[31], or a Tier 2[32] and bioaccumulative per Table 17 in WAC 246-290-71006.<br>2. Annually if the contaminant is Tier 2 and not bioaccumulative per Table 17 in WAC 246-290-71006. |

For contaminants without a MCL, MRDL, TT, or SAL, the department may use an EPA health advisory level to determine subsequent monitoring. The amendments also make technical corrections to align with federal rule language, including changing from the word "substances" to "contaminants" and removing outdated references to federal regulations.

**Costs:** Increased costs are associated with concentrations compared to the SAL. Costs for follow-up monitoring will also vary dependent upon how many Group A water system's sources have detections. Likely a Group A water system will have to take one confirmation sample following an initial detection and one quarterly sample at a minimum. If PFAS is detected in the confirmation sample, a Group A water system may be directed to take a raw source water sample. Sources with confirmed detections will be directed to complete quarterly monitoring and ongoing monitoring based upon the concentrations, as explained in department guidance in the PFAS Monitoring and Follow-Up Actions Flow Chart[33]. The cost for these follow-up monitoring samples can be derived from multiplying the number of required samples by the estimated sampling costs in the section analysis for WAC 246-290-300 above.

An estimate of the number of samples which may be required in three years is based upon sample concentrations compared to the SAL. These estimates assume a confirmation sample, a raw source water sample, and all increased quarterly and ongoing samples for one source or entry point detection.[34] Using the mean cost of $796 per sample from the sectional analysis for WAC 246-290-300, an estimated cost for one source or entry point is provided in the table below.

[31] Tier 1 means PN is required within 24 hours and this designation correlates to the quarterly monitoring requirements in this section.
[32] Tier 2 means PN is required within 30 days and this designation correlates to the annual monitoring requirements in this section.
[33] This monitoring is also outlined as a flow chart in PFAS Monitoring and Follow-Up Actions Under Draft Chapter 246-290 WAC (DOH Pub. 331-668), which can be found at https://www.doh.wa.gov/Portals/1/Documents/Pubs/331-668.pdf .
[34] WAC 246-290-320 gives the department discretion regarding monitoring frequency should it be warranted.

**Table 8: Estimated Mean Costs for Three Years of Monitoring for One Source**

| If all samples concentrations from one source are… | Number of subsequent samples required (excluding initial sample) | Estimated Mean cost[35,36] |
|---|---|---|
| **≤ 20% of the SAL** | 1 confirmation<br>1 raw source<br>1 quarterly<br>**3 total samples in 3 years** | $2,388 |
| **> 20% but < 80% of the SAL** | 1 confirmation<br>1 raw source<br>2 quarterly<br>2 years annual<br>**6 total samples in 3 years** | $4,776 |
| **≥ 80% of the SAL** | 1 confirmation<br>1 raw source<br>11 quarterly<br>**13 total samples in 3 years** | $10,348 |

While this section also establishes PN requirements, the costs and benefits associated with PN are discussed in the analysis of section WAC 246-290-71006.

**Benefit:** Proposed monitoring per this section will provide more accurate determinations of concentrations of contaminants over time. It will also allow the state to know more about the extent, locations, and severity of PFAS contamination across the state, a clear public health benefit as a first step in addressing the sources and health risks associated with PFAS contaminated drinking water.

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## WAC 246-290-455 Operation of chemical contaminant treatment facilities.

**Description:** This section establishes the monitoring requirements Group A water systems must follow when using treatment to remove or reduce a contaminant. The proposed amendments add a quarterly monitoring requirement for finished drinking water when treating to remove a contaminant or when blending water to reduce a contaminant with a SAL. This ensures the treatment or blending is effective. Group A water systems must submit the quarterly monitoring samples to a certified lab for analysis or analyze the samples using department-approved on-site methods.

**Costs:** Because the extent and severity of PFAS contamination is still unknown, the costs for this section are indeterminant. The proposed rule does not require treatment; however, we anticipate some Group A water systems will choose to treat. For systems that choose to add treatment or blend to reduce a contaminant below a PFAS SAL, the cost of this quarterly analysis will be similar to the costs associated with monitoring in section WAC 246-290-300, but for each entry point (to distribution) where treatment or other mitigation is used to reduce a contaminant below the SAL.

**Benefit:** For those systems that elect to install treatment, monitoring ensures treatment is consistently effective at removing or reducing contamination below a SAL and this means better public health protection. Additionally, it lets Group A water systems know the treatment they are providing is effective, and if not, provides feedback on treatment performances so it can be properly addressed.

[35] Mean cost per sample = $ 796 (from section WAC 246-290-300 Monitoring requirements: Table 3).
[36] Costs are not adjusted for inflation and are presented in nominal year U.S $.

## WAC 246-290-480 Recordkeeping and reporting.

**Description:** This section establishes the recordkeeping and reporting requirements for Group A water systems.

The proposed amendments add recordkeeping and reporting requirements for PFAS contaminants consistent with the recordkeeping and reporting requirements of other required chemical monitoring. Like other chemical monitoring, Group A water systems will be required to maintain chemical water quality results for PFAS for the life of the system. Records of actions taken to address a SAL exceedance must be kept for at least ten years after the last action to address the SAL exceedance. When PN is required for PFAS SAL exceedances, a certification that the PN was delivered to customers will be required. The requirements for monitoring for contaminants with a SAL and records of other actions are consistent with retention schedules for other federally regulated contaminants.

**Costs:** The costs for PFAS recordkeeping and reporting for the additional contaminants with a SAL are shown below in Table 9. Group A water systems are currently required to maintain chemical water quality data for other test panels for the life of the Group A water system, and records of actions taken to address such records for the existing MCLs. The proposed amendments only add the additional PFAS test panel for reporting and recordkeeping purposes.

In response to the department survey, 88 Group A water systems provided costs for completing the recordkeeping and reporting for PFAS as proposed in the rule.

**Table 9: Estimated Annual PFAS Recordkeeping and Reporting Costs**

| Action | Mean cost | High cost | Low cost |
|---|---|---|---|
| Annual recordkeeping and reporting[37] | $235 | $2,400 | $1 |

Table 10 below further shows distribution of the estimated sampling costs.

**Table 10: Estimated PFAS Recordkeeping and Reporting Cost Distribution**

| Estimated annual cost | Number of respondents within range |
|---|---|
| $1 to $50 | 27 |
| $51 to $100 | 17 |
| $101 to $350 | 36 |
| $900 | 1 |
| $1,001 to $2,000 | 6 |
| $2,001 to $3,000 | 1 |

As shown above, 80 out of 88 (91 percent) estimated it would cost $350 or less to complete annual required recordkeeping and reporting and half of respondents (44 out of 88) (50 percent) estimated it would cost $100 or less. Responders that provided higher cost estimates generally indicated higher labor costs per hour or time

[37] Eleven survey responses indicated $0 or no cost, which were excluded in the mean, high, or low cost calculations; One outlier response of $13,150 was removed because it was more than 2.4 standard deviations from the mean (see Aquinis et.al, Best-Practice Recommendations for Defining, Identifying and Handling Outliers; Organizational Research Methods, pg 270-301, 2013.

needed to complete the tasks. Based on these estimates, some of these responders may have reported total recordkeeping and reporting costs for all contaminants, not those solely for PFAS.

**Benefit:** These requirements for recordkeeping and reporting are standard requirements for public records transparency, which allows the public, consumers, and the department to review historical records related to these contaminants. Because we aligned these proposed requirements with the federal requirements, Group A water systems will have a familiar retention schedule with which to comply.

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## WAC 246-290-71006. [Now titled] Public notification for contaminants with a SAL

**Description:** This section requires PN to consumers following detections of contaminants with a SAL.

Proposed amendments to this section were made to change the PN requirements from a "state advisory level" to a "state action level" (SAL) based on the associated timing of PN in section WAC 246-290-315. The amendments align our PN requirements to the federal rule based upon identified Tier 1, 2 or 3 criteria (timing of PN) and establishes the contaminants with a SAL as a Tier 2 PN (within thirty days) when the SAL is exceeded.

The delivery methods per the proposed amendments ensure every consumer is notified via direct delivery and additional methods reasonably calculated to reach all consumers.

**Costs:** In response to the department survey, 108 Group A water systems provided costs if they had to complete PN as proposed in the rule.

**Table 11: Estimated Costs for Quarterly Public Notification**

| Action | Mean cost | High cost | Low cost |
|---|---|---|---|
| One Quarter of Public Notification[38] | $2,505 | $49,680 | $15 |

The table below further shows cost distribution to complete PN.

**Table 12: Estimated Quarterly Cost Distribution for PFAS Public Notification**

| Estimated Quarterly cost | Number of respondents within range |
|---|---|
| $1 to $100 | 20 |
| $101 to $500 | 34 |
| $501 to $1,000 | 18 |
| $1,001 to $5,000 | 22 |
| $5,001 to $10,000 | 7 |
| Over $10,000 | 7 |

As shown above there are wide normally distributed results for the cost to conduct PN for one quarter. Group A water systems must continue providing quarterly PN as long as they continue to exceed a SAL. Although there are some fixed costs such as developing required messaging, the variable cost of providing notices to all system users results in some large costs for the larger systems and much smaller costs for the smaller systems (based on the population served).

[38] Seven survey responses indicated $0 or no cost, which were excluded in the mean, high, or low-cost calculations.

**Benefit:** This proposed rule amendment will require PN to drinking water consumers when their water exceeds the PFAS SALs. This notification empowers communities with information that is essential to their health and wellbeing. This is especially important for women who are pregnant or who may be breastfeeding, allowing them to make timely, informed decisions about their health and the health of their families.
Most importantly, while we await federal rulemaking action on a PFAS MCL, the proposed changes will—in those communities that do have PFAS exceedances—kick start conversations between the Group A water systems and the drinking water customers that will likely be necessary to address PFAS contamination.

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## WAC 246-290-72004 Report contents - Definitions

**Description:** This section establishes the definitions to be included in the annual CCR.

The proposal adds a definition for a "state action level" (SAL) to be used in the annual CCR.

**Costs:** The department believes the costs to be minimal. See the analysis for WAC 246-290-72005 for costs associated with the additional content requirements in the CCR.

**Benefit:** The proposed change will add a definition of a SAL as a required definition in the CCR so that consumers understand what a SAL is so they may understand what a SAL exceedance means. Additionally, it will tell consumers about the health effects of the PFAS contaminants detected in their water. This change is consistent with and aligns with other federal requirements for CCR definitions.

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## WAC 246-290-72005 Report contents – Information on detected contaminants.

**Description:** This section specifies the requirements for information to be included in each CCR.

The proposed amendments to this section add a requirement for community water systems to include detected results for contaminants with a SAL in their annual CCR. Additionally, the proposal removes outdated federal requirements to better align the state rule with the federal rule.

**Costs:** The department assumes the costs will be minimal since this is only potentially additional information in CCR that Group A water systems are already preparing. There will likely include labor costs associated with educating concerned customers who want to know more about the results.

In response to the department survey, 86 Group A water systems provided costs adding PFAS sample results to their existing CCR requirements, when applicable.

**Table 13: Estimated Annual Cost for Including PFAS Results in CCR**

| Action | Mean cost | High cost | Low cost |
|---|---|---|---|
| Adding PFAS sample results to CCR annually, as applicable[39,40] | $226 | $4,071 | $5 |

Table 14 further shows distribution of the costs to add PFAS information to the system's CCR.

[39] Twelve survey responses indicated $0 or no cost, which were excluded from the mean, high, and low-cost calculations.
[40] One outlier response of $13,150 was removed because it was more than 2.4 standard deviations from the mean (see Aquinis et.al,)

**Table 14: Estimated Annual Cost Distribution for adding PFAS Sample Results to CCR**

| Estimated annual cost | Number of respondents within range |
|---|---|
| $1 to $100 | 58 |
| $101 to $500 | 21 |
| $501 to $1,000 | 4 |
| $1,001 to $5,000 | 3 |

Based on values in the survey responses (including some accompanying explanatory text) the department assumes that several respondents provided cost estimates for developing and sending the entire CCR, not just the incremental cost of adding PFAS information to the existing CCR. Regardless a majority of respondents (79 out of 86) (92 percent) indicated the annual estimated annual cost of including PFAS results in CCR would be $500 or less.

**Benefit:** This proposed requirement provides transparency regarding the quality of drinking water served, in plain language, so consumers are informed of any PFAS contamination in their drinking water and they can make informed decisions about their health and safety.

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### WAC 246-290-72012 Regulated contaminants

**Description:** This section of the rule identifies major sources of contamination in drinking water and the associated health effects language. The proposed amendments to this section include the addition of PFAS contaminants with a SAL to the table of regulated contaminants. The proposed amendments to this section made technical corrections related to the units of measure to assist Group A water systems in drafting their CCRs.

**Costs:** This section has no additional associated costs. Costs for WAC 246-290-72012 are addressed above in the analysis for WAC 246-290-72005.

**Benefit:** This will assist Group A water systems in preparing the annual CCR, both with conversions required to present data as whole numbers and by providing contaminant specific information for systems with detections above the SAL. The addition of PFAS to this table will mean that drinking water consumers receive consistent information about the contaminants found in their water and importantly it will tell them in plain language the health effects of each PFAS contaminant included in this proposal.

## Cost Benefit Summary

A survey on potential costs associated with the proposed rule revisions was sent out by the department to community and NTNC public water systems on record. Of the more than 1,000 public water systems 136 Group A water systems responded and of those 115 (85 Percent) indicated they would have varied costs associated with the proposed rules. For those systems that provided no cost or $0, many indicated that the system is operated by volunteers, thus no cost impact. For these cases the rule does impact these systems in the form of opportunity cost of labor (if they were not completing PFAS work they would be able to complete other tasks during this time), but such opportunity costs were not valued in this analysis because our survey was not designed to collect hours of volunteer labor.

Overall, Group A water systems did indicate that they would incur costs associated with the proposed rules. However, the department asserts that there are significant public health benefits to setting PFAS SALs and requiring monitoring, follow up actions, and PN for exceedances.

Importantly, it provides Group A water systems with the knowledge needed to continue to provide safe and reliable drinking water to their customers. It empowers drinking water customers to make choices that affect their health and the health of their families. It begins the necessary conversations that communities need to have as they decide how to prioritize limited public health funds to address contaminants. It also greatly expands the state's ability to determine the extent and severity of PFAS contamination in Washington's Group A drinking water sources and the environment. Initial and monitoring every three years thereafter, broadly across our state, of Group A systems will help us find impacted drinking water supplies and notify other nearby private and group B wells that they may want to test. It will start the process of finding and mitigating local sources.

Additionally, the proposal lays a foundation for other state and local efforts to address PFAS contaminants in our environment. Ecology will use the SALs in this proposal to set clean-up standards for PFAS, a necessary step in the ongoing efforts to protect public health and the environment—and a precursor to recouping costs from liable parties.

Lastly these standards will serve as a bridge until future adoption of a federal MCL and will also help the state determine if the development of a state MCL is warranted as a further step to protecting Washingtonians from the health impacts of PFAS.

Ultimately, the department concludes, based on a reasonable understanding of the quantified and qualitative costs and likely benefits from the proposed rule, that the benefits to public health of the proposed rule are greater than the costs.

| **Categories** | **Group A water systems, IOUs and SMAs** |
|---|---|
| Number sampled | Over 1,000 |
| Number responded | 136 |
| Monitoring cost range per PFAS sample[41] | $610 to $2,386 |
| Monitoring average cost per PFAS sample | $196 + $600= $796 |
| Public notification cost range per quarter | $15 to $49,680 |
| Public notification average cost per quarter | $2,505 |
| Recordkeeping and reporting annual cost range | $1 to $2,400 |
| Recordkeeping and reporting average annual cost | $235 |
| CCR annual cost range per system | $5 to $4,071 |
| CCR annual average cost per system | $226 |

[41] The department survey used an estimated laboratory cost of $600 to run a PFAS sample. This value includes the $600 estimate. . Actual laboratory cost to run sample will vary based on laboratory.

## Section 6: Identify alternative versions of the rule that were considered and explain how the department determined that the rule being adopted is the least burdensome alternative for those required to comply with it that will achieve the general goals and specific objectives stated previously.

The department considered several alternate amendments to the rule. In considering each requirement, the department chose the version that is the least burdensome for those required to comply—while still protecting public health by ensuring the people of Washington are aware of what is in their drinking water.

These major alternatives amendments considered include the following:

### Establish a state action level or maximum contaminant level for PFAS?

The department considered the similarities that both SALs and MCLs share. Both allow for the establishment of monitoring requirements, PN, use of an accredited lab and approved lab methods for PFAS sample analysis, state loan fund availability, and department technical assistance. However, the outcome of exceedances of a SAL versus an MCL are not the same.

Exceeding a federal MCL requires some form of mitigation, such actions may include:

- Installing treatment.
- Abandoning, replacing, or modifying the source of supply.
- Changing operational practices.

For those Group A water systems that exceed the SAL, the rule sets follow-up actions such as monitoring, public notification, and additional recordkeeping and reporting requirements. There may be individual situations where a water system's PFAS results are very high and pose an immediate public health threat. In those unique situations the department, the water system, and the local health jurisdiction will work together to take actions to protect public health, as they would in the event of any known or unknown contaminant. If supported by the facts and emerging science, the local health officer and/or the department may order a water system to take action to remedy a public health emergency under its general authority to regulate drinking water systems, including RCW 70A.125.030(1); RCW 70.05.070; RCW 43.70.130(7). This would be a case-by-case decision, not a requirement of general application under this rule.

Without a clear understanding of the full extent of PFAS contamination in our drinking water supplies, which is necessary to understand the scope of impact and establish a state MCL, the board directed the department to establish PFAS SALs. The following are some reasons a SAL is the type of health-based standard needed at this time.

The SALs:

- Are state drinking water standards that are recognized by Washington State and federal cleanup standards.
- Set monitoring requirements to establish a baseline of PFAS contamination occurrence and severity in Washington State.
- Are based on enough scientific information to require notification to drinking water customers upon a confirmed detection and require follow-up actions Group A water systems must take when PFAS SALs are detected or exceeded.
- Allow for data collected combined with the developing science to support future state MCL development, if appropriate.

Currently setting SALs for PFAS instead of MCLs is the least burdensome alternative that meets the general goals and specific objectives of the statutes. It also addresses the need for gathering data to consider in developing an MCL.

### Should exceedance of PFAS SALs be defined as a confirmed detection or require a Running Annual Average (RAA)?

In setting SALs for PFAS, the board considered whether to set an exceedance or a violation of the standard at a confirmed detection or to use an RAA. EPA has defined MCL exceedances for most regulated chemical contaminants, including other persistent bioaccumulative toxicants such as dioxin (2,3,7,8-tetrachlorodibenzodioxin) and Polychlorinated biphenyls or PCBs, as having an RAA that exceeds the MCL. The only exceptions are for nitrate and nitrite, which are regulated as acute contaminants. Many other states are using an RAA approach for PFAS, but some states use a confirmed detection approach.

The main difference between using an RAA or a confirmed detection for the proposed PFAS SALs is in timing of PN. Under the current proposal, Group A water systems would need to notify their customers within 30 days when water testing confirms a detection of PFAS greater than the SAL at any sampling time point. With a RAA approach, quarterly water tests must add up to four times the SAL threshold before the SAL is "exceeded". The PN under this scenario could be delayed 3-9 months after the water tests greater than a PFAS SAL. PFAS are considered a developmental toxicant. Three to nine months comprises a significant proportion of pregnancy or lactation period during which people may choose to take action to limit their exposure.

For most Group A water systems testing for PFAS under this proposed rule, this will be their first-time testing for PFAS. Many industries or other users of PFAS chemicals have been releasing PFAS into the environment since the 1950s. PFAS are highly persistent in groundwater. With this in mind, the department determined that unless we have data to indicate otherwise, we should assume and act as if a community that exceeds a PFAS SAL has already had prolonged exposure, potentially over many years. This is important for a bio-accumulative chemical.

The proposal uses a confirmed detection for PFAS to trigger PN which is similar to EPA's advice for PN for their HAL, where they recommend notification of the public after a confirmed detection of a PFAS concentration above the HAL.[42]

A confirmed detection more precisely meets the general goals and specific objectives of the statutes and is the least burdensome alternative that does so.

### Should SALs be set for groups of PFAS or individual PFAS?

Five proposed SALs were developed as indicators to identify PFAS contamination in public drinking water supplies. The proposed SALs represent health protective levels—expected to be without appreciable health effects over a lifetime of exposure for the general population, including in sensitive subgroups.

PFAS frequently appear as mixtures in drinking water. Use of these five proposed SALs as indicators, provides a reasonable initial approach to protect the public from PFAS mixtures in drinking water. Less is known about the other PFAS although many can be removed by the same mitigation technologies employed to remove the five PFAS with SALs.

[42] https://www.epa.gov/sites/production/files/2016-06/documents/drinkingwaterhealthadvisories_pfoa_pfos_updated_5.31.16.pdf Primary source document: https://www.doh.wa.gov/Portals/1/Documents/4200/PFAS-DOHApproach.pdf

When Group A water systems take actions based on a PFAS SAL, the department encourages them to choose mitigation options that are effective at removing many PFAS such as granular activated carbon and anion exchange resin filtration. Ultimately, a more comprehensive grouped approach to regulation is preferred to a chemical-by-chemical approach given the large size of the PFAS class of chemicals.

As the science advances, PFAS could be grouped according to subclasses based on key characteristics such as chemical structure, bioavailability, bioaccumulation potential, toxicity, or mechanism of action. A group approach will be considered in the future to regulating PFAS mixtures if a method becomes available that is supported by science.

The five proposed PFAS with SALs are the best studied of the PFAS commonly detected in our state's drinking water. The approach to developing SALs involved evaluation of the primary PFAS scientific literature and review of recent assessments by federal agencies and several U.S. states. The selected health protective values are from high-quality recent science assessments. Sufficient information was found to recommend SALs for PFOA, PFOS, PFNA, PFHxS, and PFBS.

All five PFAS with SALs have validated methods for measuring in drinking water and the department determined the proposed rule changes are the least burdensome alternative for those required to comply that achieves the goals and specific objections of the underlying statutes. A detailed technical support document that describes the approach, assumptions, and the derivation of each PFAS SAL is available online[43].

## Section 7: Determine that the rule does not require those to whom it applies to take an action that violates requirements of another federal or state law.

The rule does not require those to whom it applies to take an action that violates requirements of federal or state law.

## Section 8: Determine that the rule does not impose more stringent performance requirements on private entities than on public entities unless required to do so by federal or state law.

The rule will not impose more stringent performance requirements on private entities than on public entities. The proposed changes in this rule apply equally to all Group A community and NTNC water systems without regard to ownership, whether it is publicly or privately owned.

## Section 9: Determine if the rule differs from any federal regulation or statute applicable to the same activity or subject matter and, if so, determine that the difference is justified by an explicit state statute or by substantial evidence that the difference is necessary.

The proposed rule does not differ from any applicable federal or state regulation or statute applicable to the same activity or subject matter.

[43] Ibid. page 14, footnote 25

## Section 10: Demonstrate that the rule has been coordinated, to the maximum extent practicable, with other federal, state, and local laws applicable to the same activity or subject matter.

The board and department are coordinating internally to address the necessary changes to chapter 246-390 WAC, the Drinking water laboratory certification and data reporting rule, to align it with the proposed amendments. They also worked to align the proposed SAL monitoring and reporting requirements with existing federal monitoring and reporting requirements for regulated contaminants.

It should also be noted that the department has been collaborating with the Department of Ecology since 2016 on a PFAS CAP[44]. A CAP identifies, characterizes, and evaluates uses and releases of a specific Persistent Bioaccumulative Toxin (PBT), a group of PBTs, or metals of concern, and recommends actions to protect human health or the environment.

Ecology's PFAS CAP makes several recommendations to the legislature relevant to this rulemaking and the subsequent costs associated with ensuring safe and reliable drinking water.

Recommendation 1.1 states,

> "State agencies, the Washington State Legislature, and local water systems should work together to fund PFAS drinking water mitigation. These costs should be reimbursed by responsible parties under applicable laws. Once PFAS water contaminants are officially classified as hazardous substances by the federal government or by the state of Washington, they can be addressed under the state Model Toxics Control Act (MTCA) framework."

Recommendation 2.1, states,

> "Using existing authority under MTCA, Ecology will develop cleanup levels for PFOA and PFOS (and additional PFAS as appropriate). Ecology will use the State Board of Health's (SBOH) drinking water standards or other advisories adopted in rule to develop these cleanup levels."

As previously mentioned, the drinking water standards proposed in this rulemaking are foundational to other regulatory changes that are needed to protect Washingtonians' health and the environment. The department is, and will continue, working closely with Ecology and others to coordinate our actions with others to accomplish the necessary next steps to address PFAS contamination in Washington State.

Lastly, the proposal also allows Group A water systems that sample for PFAS under UCMR 5, and meet certain criteria, to satisfy their initial monitoring requirements under this rule proposal as the timing of the requirement for initial monitoring in this proposal will overlap with the EPAs monitoring requirements in UCMR 5. This allowance will reduce redundancies and for some systems it will reduce the cost of compliance with the requirements in this proposal.

[44] Ibid. page 5, footnotes 17 and 18.