

“Forever Chemicals” in Groundwater

John Lovie



Whidbey Island Water Systems Association

- Represents water systems, private well owners
- About 100 members
- Group A, Group B water systems, private wells, associate members
- Recipient of a Public Participation Grant from Washington State Department of Ecology
- whidbeywatersystems.org
- mail@whidbeywatersystems.org

Disclaimer

This material is funded through a Public Participation Grant from the Washington State Department of Ecology. The content was reviewed for grant consistency but is not necessarily endorsed by the agency.

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Overview

- Timeline
- Limits
- Detections
- Potential Sources
- Cleanup Process
- Environmental Report Tracking System (ERTS)
- PFAS Cleanup Guidance
- Alternative solutions for drinking water
- Sourcewater Protection
- Paying for cleanup
- Public Participation Grants



PFAS in Drinking Water Timeline



UCMR3 – Third Unregulated Contaminant Monitoring Rule

EPA LHA – Environmental Protection Agency Lifetime Health Advisory

PFAS CAP – Per- and Poly-Fluorinated Alkyl Substances Chemical Action Plan

DOH SALs – Washington State Department of Health State Action Limits

MCL – Maximum Contaminant Level

PFAS Regulatory Limits

| PFAS | PFAS Name | 2016 EPA LHA ng/l | DOH SAL ng/l | Ecology Cleanup ng/l | 2022 EPA LHA ng/l |
|-------|--------------------------------|-------------------|--------------|----------------------|-------------------|
| GenX | GenX Chemicals | | | 24 | 10 |
| PFBS | (PFBS) PFbutane sulfonic acid | | 345 | 345 | 2000 |
| PFHxS | (PFHxS) PFhexane sulfonic acid | | 65 | 65 | |
| PFNA | (PFNA) PFnonanoic acid | | 9 | 9 | |
| PFOA | (PFOA) PFOctanoic acid | 70 | 10 | 10 | 0.004 |
| PFOS | (PFOS) PFOctane sulfonic acid | 70 | 15 | 15 | 0.02 |

DOH Voluntary Testing Program

- Group A water systems
- Take-up varied widely across the state
- Some counties submitted no samples
- Overall, 1000 out of 7000 systems have been tested, but predominantly in the northwest
- Island County is the leader, with 137 out of 293 Group A systems tested
- The 10% detection rate in Island County (14 systems) is holding up across the state
- 700 Group A, 1800 Group B, and thousands of private wells can be expected have detections
- With MCLs, new methods, and compulsory testing, thousands of exceedances can be expected



The data is in
[Sentry Internet | Washington State Department of Health](#)

- Water quality data report
- Filter out pesticides
- Filter out non-detects (≤ 2 ng/l)
- Water system names are in a separate table. A lookup is needed.



Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Help

Water Quality Data By County, Year And Analyte Group

Download Explanation: This export provides a listing of all water quality data for a county based on the selected criteria. The following must be selected: county, year, and analyte group.

Download Filters: Enter or select at least one filter to generate the download.

County: ISLAND

Water System Group: Group A

Year: 2022

Analyte Group: SOC -- SYNTHETIC ORGANIC CONTAMINANTS

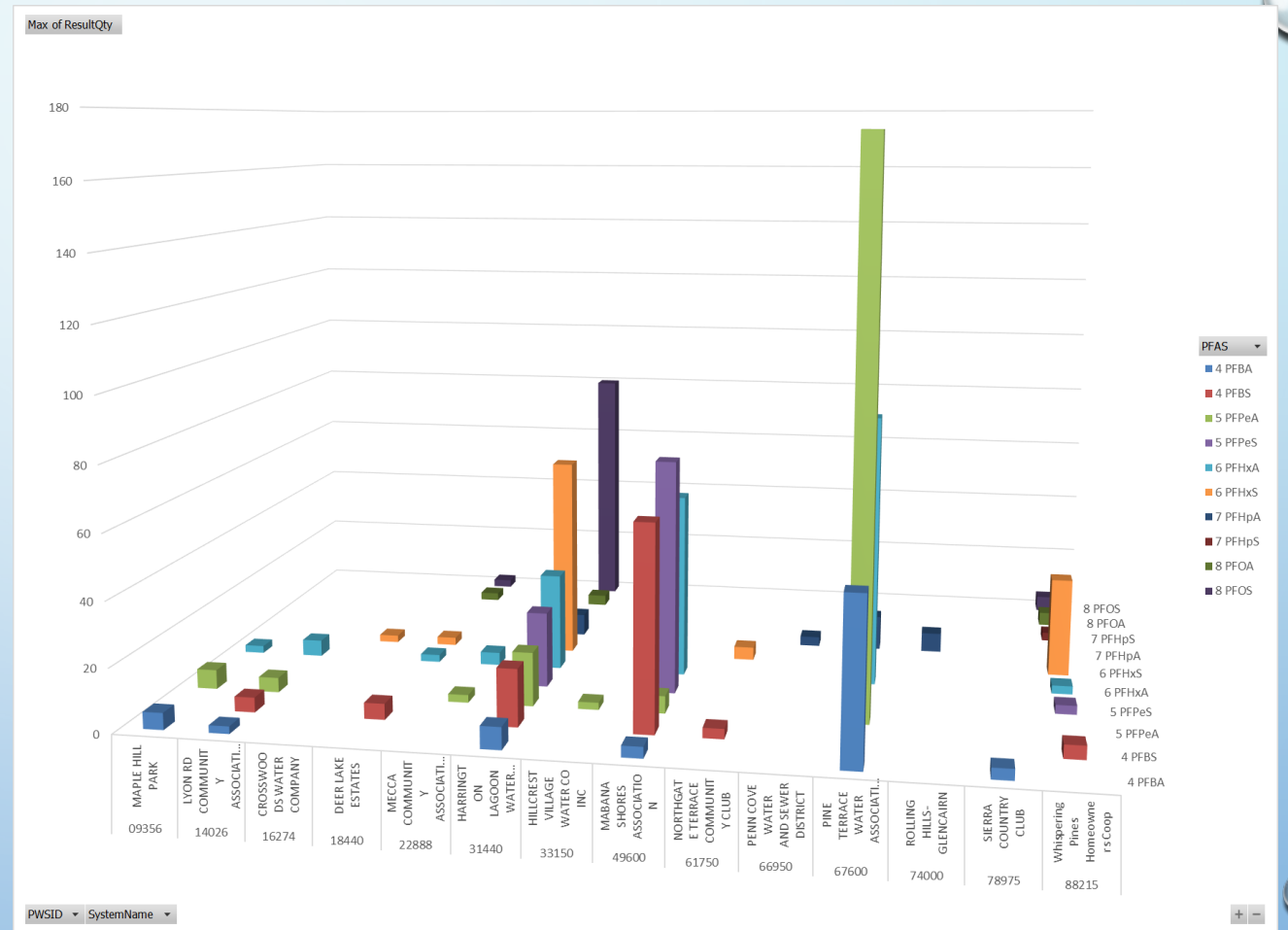
Export CSV Clear

Island County PFAS Detections in DOH Voluntary Testing Program

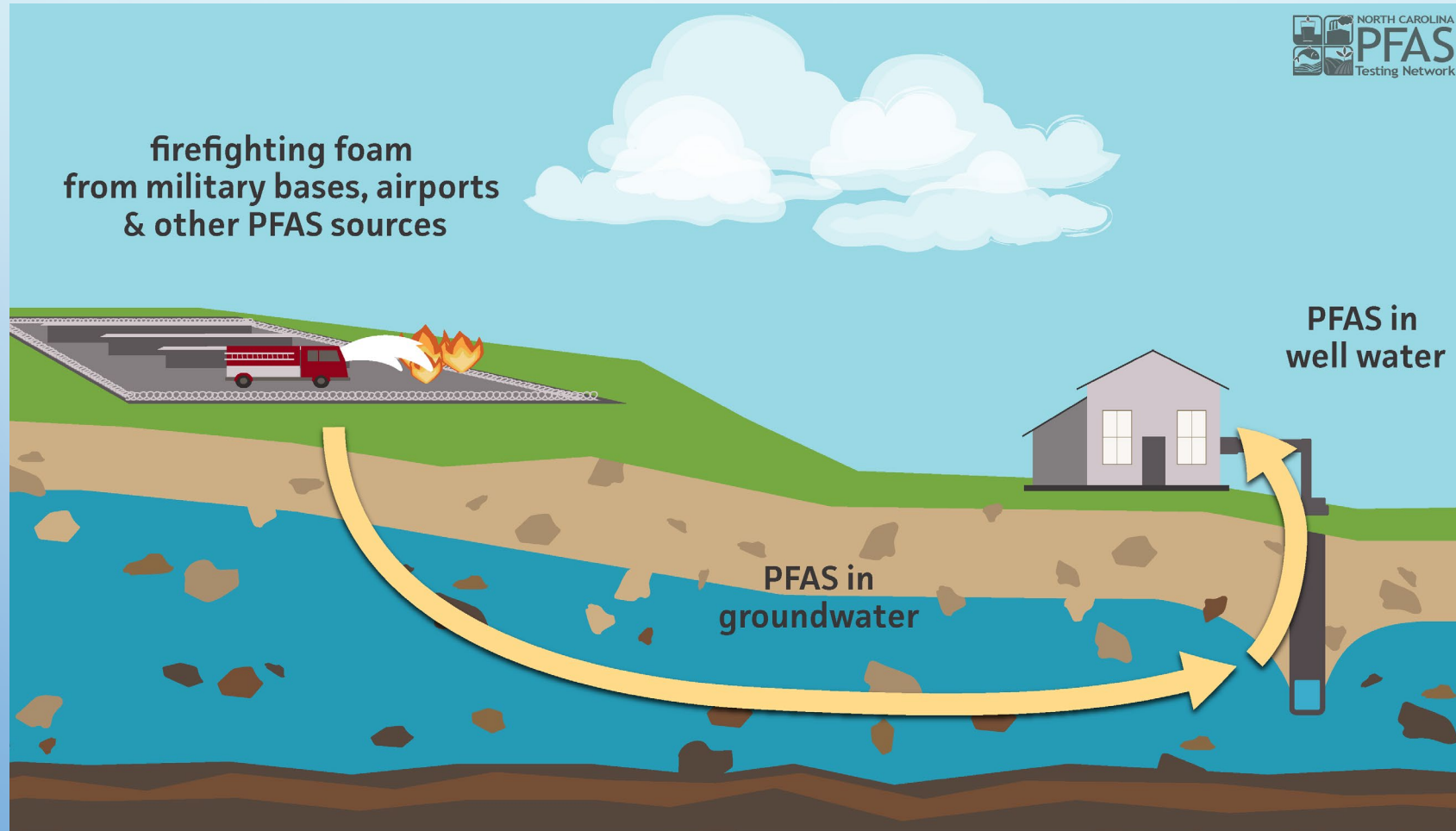
- 14 systems with detections out of 137
- One exceeds old LHAs
- One exceeds SALs
- Four exceed new LHAs

BUT

- With MCLs and new analytical methods, many more exceedances can be expected



What are the sources of PFAS in drinking water?



AFFF - Washington State Department of Ecology



Firefighting foam
is the suspected source of
all PFAS contamination in
our state's
drinking water.



PFAS in Firefighting Foam (wa.gov)

Collection and disposal program

Environmental Impact Statement



PFAS in Firefighting Foam

Aqueous film-forming foam (AFFF) is a firefighting foam used to combat flammable liquid-based fires. AFFF extinguishes fires by creating a barrier between the material fueling the fire and the air, cutting off the oxygen it needs to burn.

Per- and polyfluoroalkyl substances (PFAS) are used in firefighting foam due to their ability to resist heat and dissolve in water. However, **PFAS are toxic chemicals that do not naturally break down in the environment.**



To request an ADA accommodation, contact Ecology at 360-407-6700 or hwtrpubs@ecy.wa.gov, or visit ecology.wa.gov/accessibility. For Relay Service or TTY, call 711 or 877-833-6341.

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State of Washington

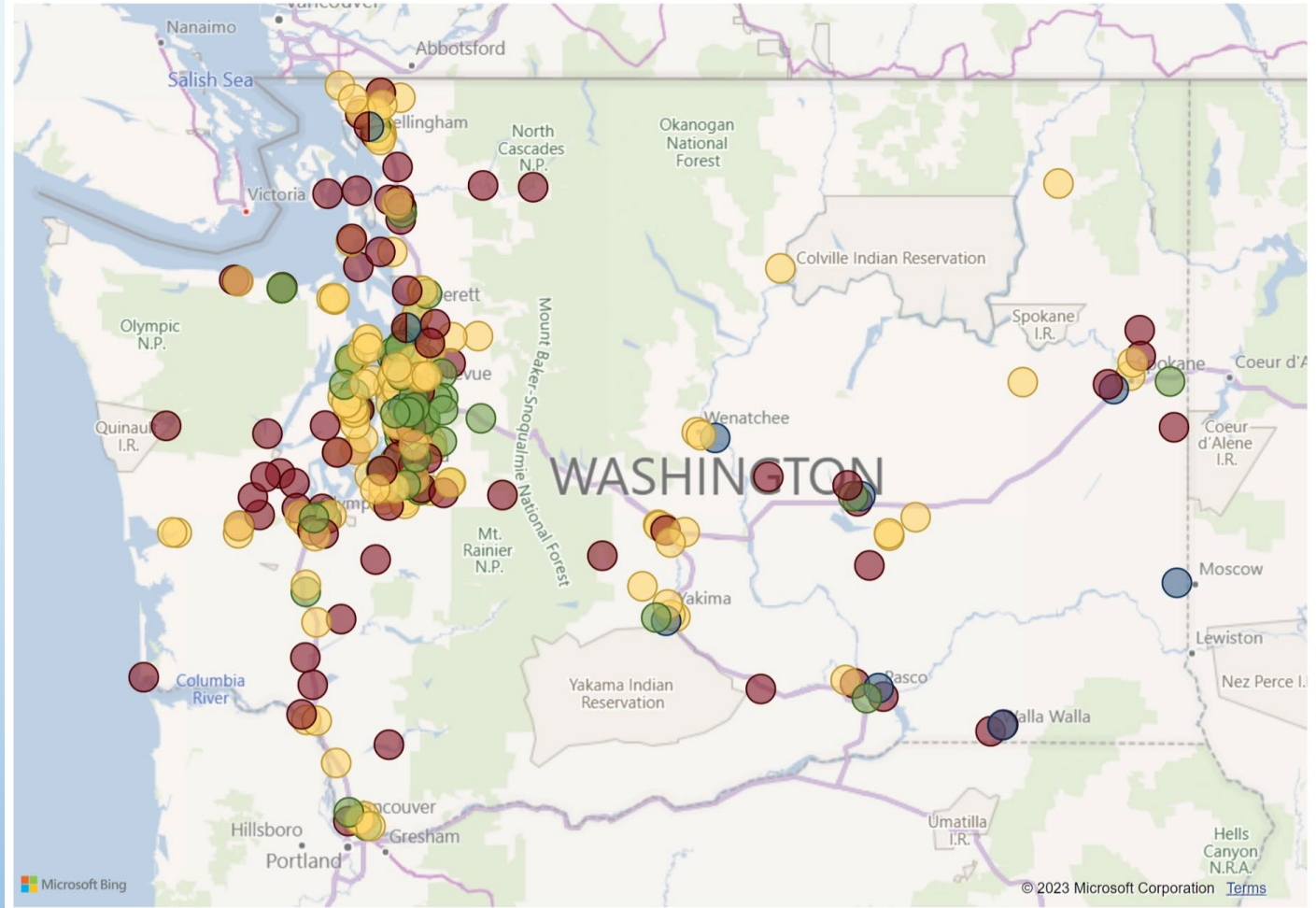
Publication: 22-04-037
August 2022

Product Replacement Program - Washington State Department of Ecology

● Fire departments who plan to participate in Ecology's AFFF firefighting foam disposal program

Businesses participating in Ecology's Product Replacement Programs

Business type ● Airport ● Auto Repair ● Dry cleaner ● Fire Department



Microsoft Power BI

172%



Cleanup process - Washington State Department of Ecology

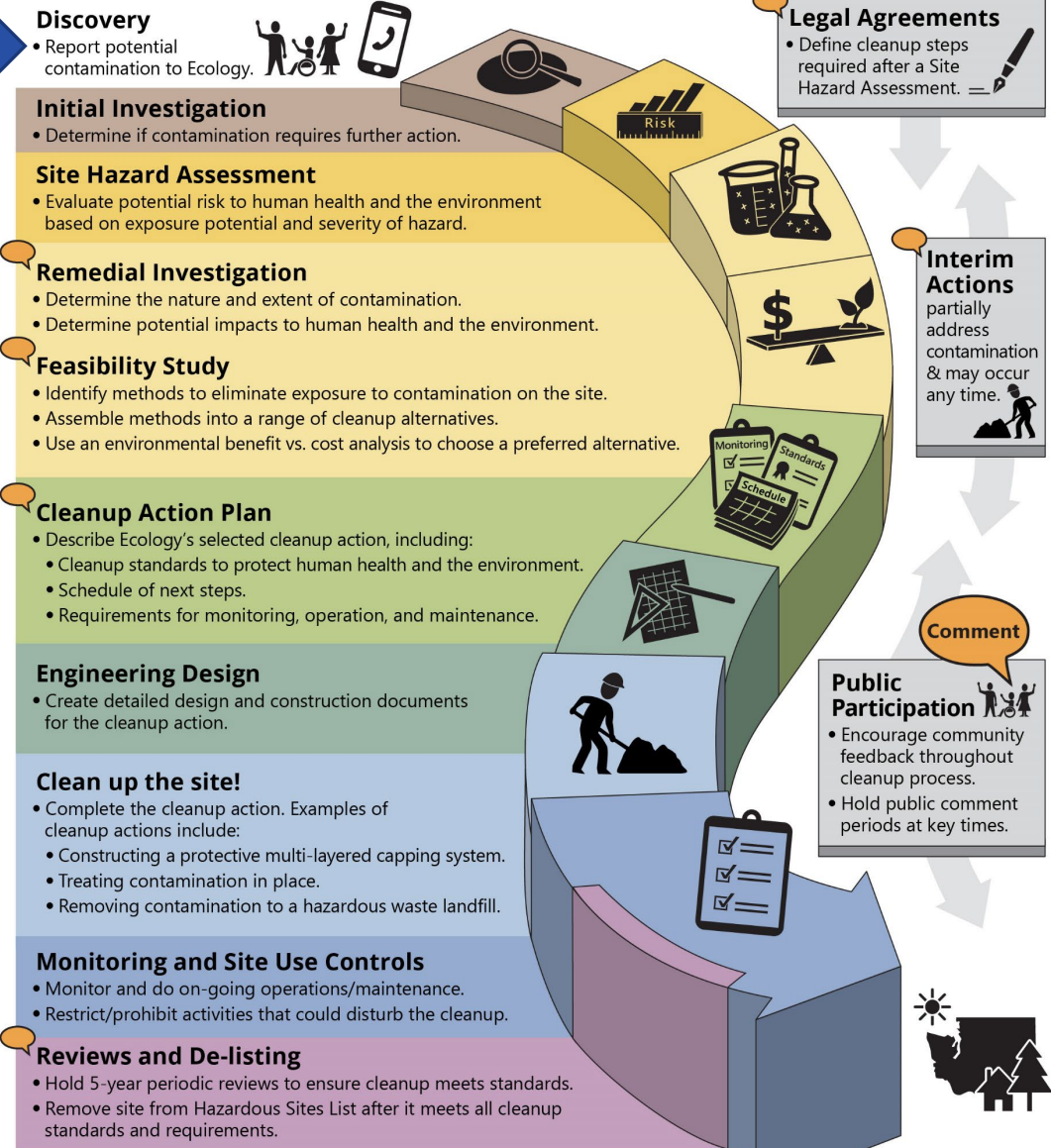


Discovery

- Report potential contamination to Ecology.



Washington's Formal Cleanup Process



Washington's Cleanup Law
Model Toxics Control Act (MTCA)

MTCA defines the cleanup process. This public-initiated environmental law directs upland cleanups (on land or in groundwater) and sediment cleanups (in freshwater or marine environments). Ecology enacts MTCA and regulates the cleanup process.



Statewide reporting form ERTS - Washington State Department of Ecology

Who is reporting?

Where did it happen?

What happened?

Who might be responsible?

DEPARTMENT OF **ECOLOGY**
State of Washington

Regulations & Permits Research & Data Blog Contact Us

Home Air & Climate Water & Shorelines Waste & Toxics Spills & Cleanup

Report an environmental issue > Statewide reporting form ERTS

Statewide Environmental Incident Report Form (ERTS)

If you see a spill or other environmental problem, we encourage you to report it. The sooner Ecology knows about an incident, the quicker we can act to reduce damages to our environment and protect sensitive natural resources.

Please use this Environmental Report Tracking System (ERTS) form to notify us of environmental issues in any Washington county.

Reports submitted using this form or via email are **only monitored during business hours**.

If this is an emergency, please contact the Washington State Emergency Management Division at **1-800-258-5990**.

NOTE: This form has display issues when viewed in Internet Explorer. Please use Edge, Chrome, Firefox or Safari.

Who is reporting?
(About the reporting party)

Your first name

Your last name

Confidential?

If you indicate "Yes" your contact information will not be shared with external agencies.

Reporter type
Select one:

Your organization name (if any)

Your email

If you provide an email address, you will receive a confirmation email with the information you have provided in this form.

Reporting Environmental Contamination

Reporting not required for water systems but much appreciated
We won't list your water system; we'll list potential source or unknown source
You don't need to know source or have much data but any info on potential sources is appreciated

Reporting environmental contamination

What to Report

Detection of PFAS in water system
Any suspected environmental contamination

Reporting Options

Email nwroerts@ecy.wa.gov
Call 206-594-000
Online reporting form

Any Spill to Surface Water

Call immediately 24/7
800-OILS-911 / 800-645-7911

Finding the Reporting Form

Visit Ecology's web site at ecology.wa.gov
Click on "Report environmental issues"
Click on "Report other environmental issues"
Go to the section for the Northwest Region

Cleanup Process in Action

[Eastside Fire & Rescue Headquarters - \(16581\) \(wa.gov\)](#)

Initial Investigation

Further Action Required

Cleanup Started

Permeable Reactive Barrier

Eastside Fire & Rescue Headquarters

175 Newport Way NW
Issaquah, King County

Facility Site ID: 83936264

Cleanup Site ID: 16581

Site Status

Cleanup Started

Site Details

Download Site Report

View documents **32**

View contaminants **4**

Contacts

Priscilla Tomlinson
priscilla.tomlinson@ecy.wa.gov
Site Manager
206-594-0104

Northwest Regional Office
206-594-0000

More about cleanup

- Cleanup comment periods and events
- Terms and acronyms
- The cleanup process
- Contaminated sites in Washington

Initial Investigation

When Ecology learns about a release of a hazardous substance into the environment, we do an Initial Investigation. Release information may come to us through the [Environmental Report Tracking System](#), either from the property owner making a required notification or as a complaint from someone who saw the release.

During the Initial Investigation, we evaluate environmental conditions at the property and review all available data. The goal of the Investigation is to determine if the release may pose a threat to human health or the environment, and if further cleanup actions are needed. We track any site that is suspected or confirmed to be contaminated with hazardous materials, as required by the [Model Toxics Control Act](#) (MTCOA).

Further Action Required

Ecology has conducted an Initial Investigation and determined that remedial action is needed at this site. Ecology will establish a priority for investigation and cleanup of this site under the MTCOA process and may evaluate the potential threat to human health and the environment in the future.

Documents **32**

Places to see print documents

Northwest Regional Office

15700 Dayton Ave N
Shoreline, 98133
206-594-0016

Please schedule an appointment to view print documents at this location.

Contaminants **4**

| Contaminant Type | Soil | Groundwater | Surface Water | Air | Sediment | Bedrock |
|--------------------------------------------------------------------------------|----------------|----------------|---------------|-----|----------|---------|
| Non-Halogenated Organics - Petroleum-Diesel [?] | | B [?] | | | | |
| Non-Halogenated Organics - Petroleum-Gasoline [?] | | B [?] | | | | |
| Non-Halogenated Organics - Petroleum-Other [?] | | B [?] | | | | |
| Halogenated Organics - Per- and polyfluoroalkyl substances (PFAS) [?] | C [?] | C [?] | | | | |

- S** Suspected
- C** Confirmed Above Cleanup Levels
- B** Below Cleanup Levels
- RA** Remediated-Above
- RB** Remediated-Below
- R** Remediated

i This contaminant list was based on our best information at the time it was entered. It may not reflect current conditions at the site.



Cleanup Levels

[Focus on: PFAS cleanup levels \(wa.gov\)](https://www.wa.gov)



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Photo credit: jplenio on Pixabay

Focus on: PFAS Cleanup Levels

Purpose and background

This focus sheet provides the Washington State Department of Ecology's (Ecology's) recommended soil and groundwater cleanup levels for part of a group of harmful compounds known as per- and polyfluoroalkyl substances, or PFAS. These compounds include:

1. PFOA, or perfluorooctanoic acid,
2. PFOS, or perfluorononanoic acid,
3. PFNSA, or perfluorohexane sulfonic acid,
4. PFHxS, or perfluorobutane sulfonic acid, and
5. PFBS, or perfluorobutane sulfonic acid, and
6. HFPO-DA (GenX), or hexafluoropropylene oxide dimer acid.

The Washington State Department of Health (DOH) issued a final rule that included groundwater State Action Levels (SALs) for the first five PFAS compounds listed above, which became effective on January 1, 2022. The Department of Health calculated the SALs using peer-reviewed non-cancer reference doses (RfDs) that represent the best available science. They used RfDs to establish the SALs because there are limited data available to support a quantitative assessment of cancer risk for PFAS compounds.

We calculated the recommended groundwater cleanup level for HFPO-DA using Model Toxics Control Act (MTCA) [Equation 720-1¹](#) and EPA reference doses (RfDs).

For comparison purposes, we've also included the Environmental Protection Agency's (EPA) Health Advisory Levels for PFOA, PFOS, PFBS, and HFPO-DA. EPA is still evaluating the RfDs they used to develop the interim Health Advisory Levels for PFOA and PFOS, and it's possible these levels could be revised in the future. EPA is also developing RfDs for several other PFAS compounds, which may lead to additional groundwater health advisories.

Table 1: Recommended groundwater cleanup levels

| PFAS Compound | Recommended Groundwater Cleanup Level | EPA Health Advisory Level |
|----------------|---------------------------------------|---------------------------|
| PFOA | 10 ng/L | 0.004 ng/L |
| PFOS | 15 ng/L | 0.02 ng/L |
| PFNA | 9 ng/L | None |
| PFHxS | 65 ng/L | None |
| PFBS | 345 ng/L | 2,000 ng/L |
| HFPO-DA (GenX) | 24 ng/L | 10 ng/L |



Midway Island Water Systems
Association
Safe. Affordable. Pure Water.



DRAFT Guidance for Investigating and Remediating PFAS Contamination in Washington State

Toxics Cleanup Program

Washington State Department of Ecology
Olympia, Washington

December 2022 | Publication No. 22-09-058



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Public comment period extended to March 3, 2023



Submit a comment

[Draft PFAS guidance for investigating & remediating PFAS contamination in Washington state \(commentinput.com\)](#)

Public Comment Form

Commenting open: December 15, 2022 12:00AM PT - March 03, 2023 11:59PM PT.

Draft PFAS guidance for investigating & remediating PFAS contamination in Washington state

**** Comment period extended through Friday, March 3, 2023 ****

You're invited to review and comment on a draft guidance for investigating and remediating PFAS contamination in Washington state.

Per- and polyfluoroalkyl substances are collectively known as PFAS. This group comprises thousands of unique synthetic organic chemicals that are extremely stable and persistent. The draft guidance provides potentially liable persons, cleanup project managers, and consultants a practical approach for cleaning up PFAS contamination at sites in Washington.

Download the guidance using the green button below at right.

This 79-day comment period is open from Thursday Dec. 15, 2022, until 11:59PM Friday March 3, 2023.

Contact Information

All fields are optional unless otherwise indicated.

Submitted By: Individual

First Name (Required): _____ Last Name (Required): _____

Address: _____ City (Required): _____

State: Washington ZIP: _____

Email: _____

Your Comment

[View Comments](#) [Download Document From Ecology's Website](#)

Insert comments on Draft PFAS guidance for investigating & remediating PFAS contamination in Washington state

[Upload File](#)

Uploading a file is optional

You may attach up to five 30 MB files to accompany your submission. Allowed formats are pdf, jpg, jpeg, png, txt, gif, doc, docx. If you experience technical difficulties submitting your comment, please contact the person listed at the bottom of this page.

[Continue »](#)



Alternative Solutions

Bottled water

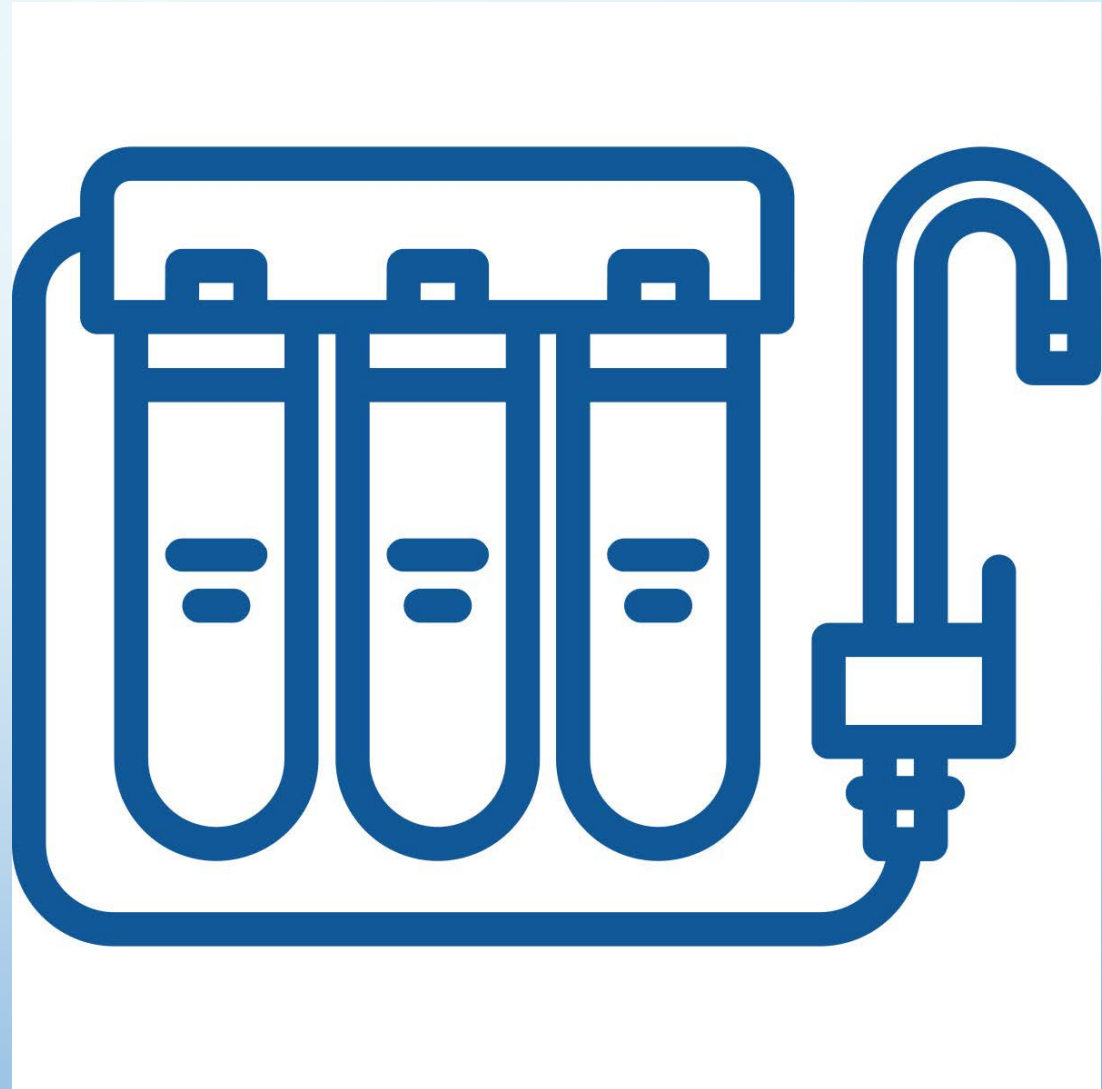
Point of use filtration

Treatment of drinking water

Relocation of wells

Consolidation of water systems

Clean up of groundwater



Sourcewater Protection

We are used to doing this for surface water

What tools exist to protect groundwater?



Paying for cleanup

A core principle of MTCA is “polluter pays”

Everyone who touches the material is a
Potentially Responsible Person (PRP)

Some states have sued the manufacturers

It will take a long time to recover the money

Need a fund NOW!



Public participation grants - Washington State Department of Ecology

Funding cycle

- **Amount of funding available:** \$4.87 million for 2023 – 2025
- **Grant award limit:** Up to \$60,000 per year, for up to two years
- **Amount of matching funds required:** No matching funds are required.

Application information

Who's eligible

Eligible project types

Applications are not being accepted at this time.

We will accept applications for the 2023 – 2025 biennium starting March 8, 2023 and closing at 5 p.m. on April 5, 2023.

Application information

Who's eligible

Eligible project types

Funding is available for the following entities:

- Individuals affected by the release of a hazardous substance.
- Nonprofit public interest organizations.

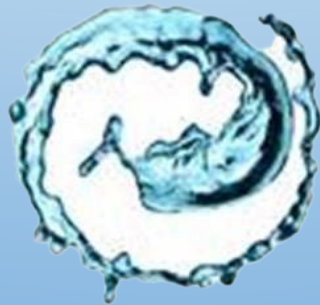
Application information

Who's eligible

Eligible project types

PPG will fund two basic types of projects:

- Projects that engage the public in the investigation and remediation of a release or threatened release of a hazardous substance.
- Projects that support the state's Solid and Hazardous Waste Management Priorities.



Safe Adequate Water

“Forever Chemicals” in Groundwater

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