



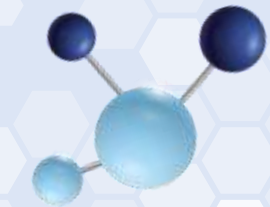
# PFAS in Food Service & Facility Maintenance

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# What is NEWMOA?

- Northeast Waste Management Officials' Association
- Non-profit, non-partisan interstate association
- Solid waste, hazardous waste, waste site cleanup & pollution prevention programs
- CT, ME, MA, NH, NJ, NY, RI & VT
- Formally recognized by EPA in 1986
- [www.newmoa.org](http://www.newmoa.org)





# Agenda

- What is PFAS & why do we care?
  - How PFAS gets into the environment
  - Information about PFAS in food service & facility maintenance (carpet cleaning & floor stripping & waxing), including ideas to reduce use
  - Outline of project with NEKWMD & resources developed
- 



# **“Before” Poll Questions**

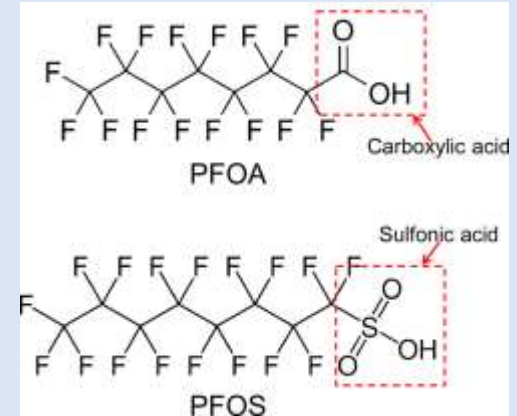
**Thank you for your patience!**



# What are PFAS?

## PFAS stands for Per- and Polyfluoroalkyl substances

- A group of thousands of synthetic chemicals used in hundreds of types of products
  - Water-resistant/waterproof
  - Oil/grease resistant
  - Stain resistant
  - Resistant to friction
- Known as “forever chemicals”
- Main characteristic: Fluorine attached to Carbon
  - The number of carbons determines the length of the PFAS (C6, C8, etc.) and if it is considered a long-chain or short-chain

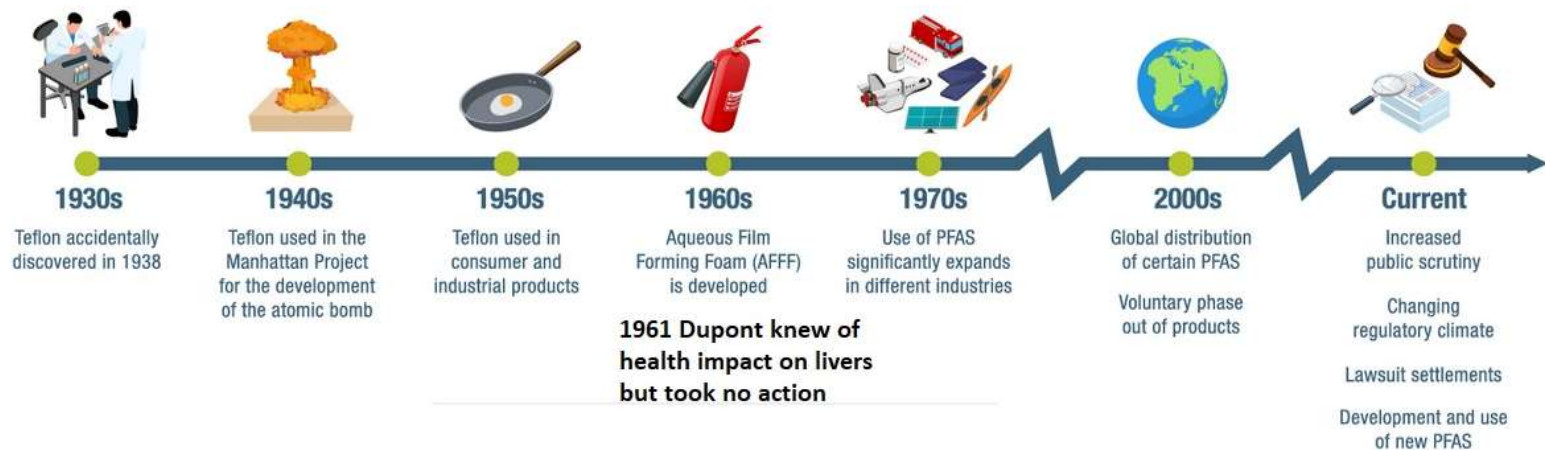


# Most people think if something is for sale, that means it's safe...(but that's not true)

## How did PFAS develop and evolve?

### PFAS Development ...

### ...and Evolution





# Why are PFAS so Problematic?

<b>The carbon-fluorine bond is NOT natural</b>	<ul style="list-style-type: none"><li>• Created with tremendous heat and pressure</li><li>• Per (fully) fluorinated PFAS do not breakdown – poly (partially) fluorinated PFAS breakdown only into the fully fluorinated portion which then doesn't change</li><li>• <b>Accumulating all over the planet &amp; in the blood of virtually all animals &amp; people</b></li></ul>
<b>PFAS impact human &amp; environmental health</b>	PFAS impact the health of humans, animals, fish and other living beings even with exposure at relatively low levels
<b>PFAS have polluted water supplies</b>	Public water supplies – must test for PFAS - 17 in Vermont have exceeded current standards Private wells – can be contaminated from a variety of sources – including septic systems

**PFAS were not a regulated chemicals... until recently!**



# PFAS Toxicity and Health Effects

PFAS are Linked to a Multiplicity of Adverse Health Effects



**Reduced Immune System Function**



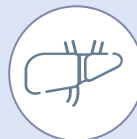
**Increased Risk of Pre-eclampsia in Pregnant Women**



**Increased Cholesterol Levels**



**Increased Thyroid Disorders and Other Hormone Disruption**



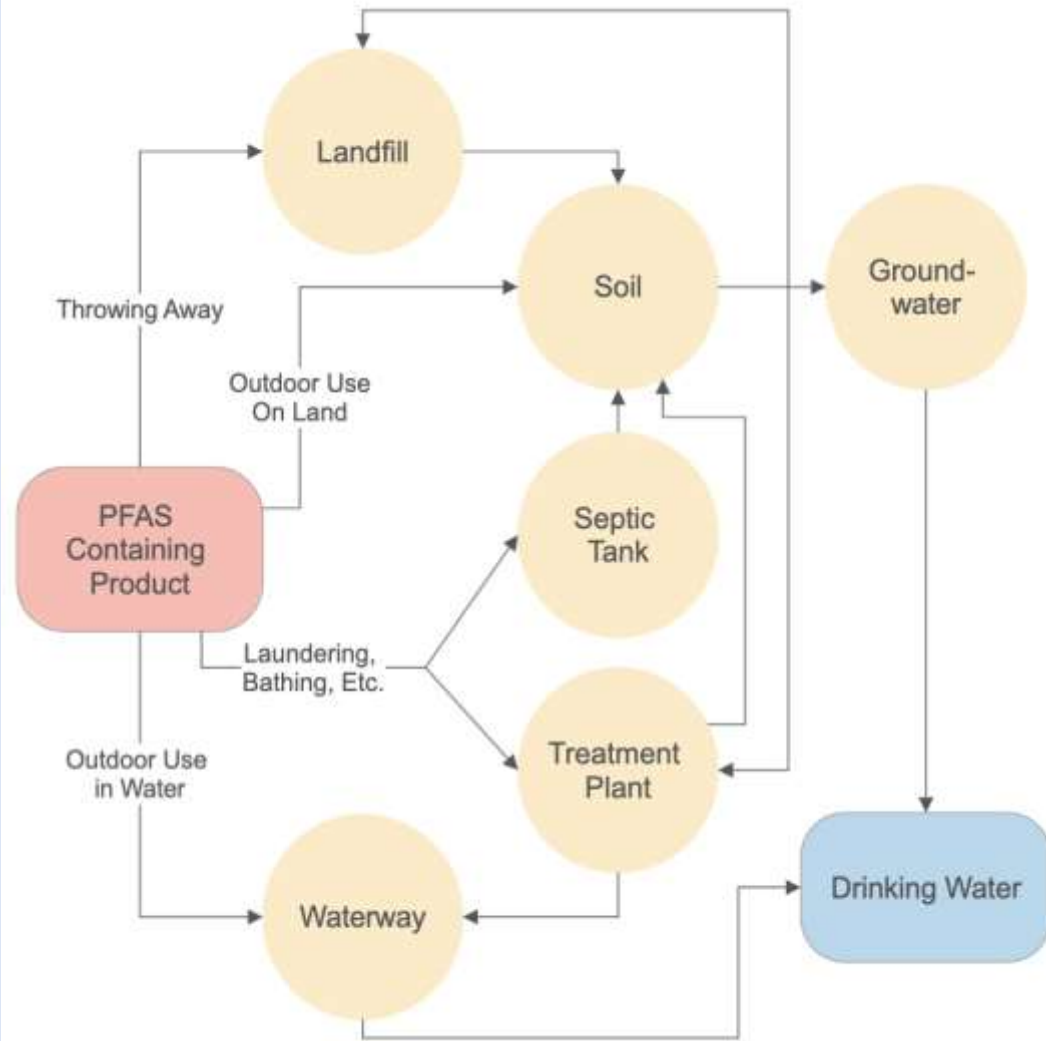
**Increased Risk of Liver, Kidney, Prostate & Testicular Cancer**





# How PFAS in Products Might Impact the Environment


- Remember – they do NOT breakdown – they just move around
- PFAS can get into groundwater or surface water used for drinking water & lead to significant exposure
- Note: there are other sources of environmental contamination:
  - Firefighting foam
  - Manufacturer use
  - Air deposition
- BUT – studies have shown that wastewater from homes has significant amounts





# Vermont DEC Wastewater Study

In 2021, DEC worked with the City of Essex Junction and Town of Middlebury to characterize residential, commercial, and industrial PFAS sources entering their WWTFs and found:

- More PFAS, by mass, were measured in wastewater originating from residential communities than from commercial or industrial discharges in these municipalities
  - Industrial facility discharges contained unique PFAS but were not a significant source of PFAS to the WWTF, accounting for < 1% of the total mass of PFAS entering the WWTF
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# What Products Often Contain PFAS?



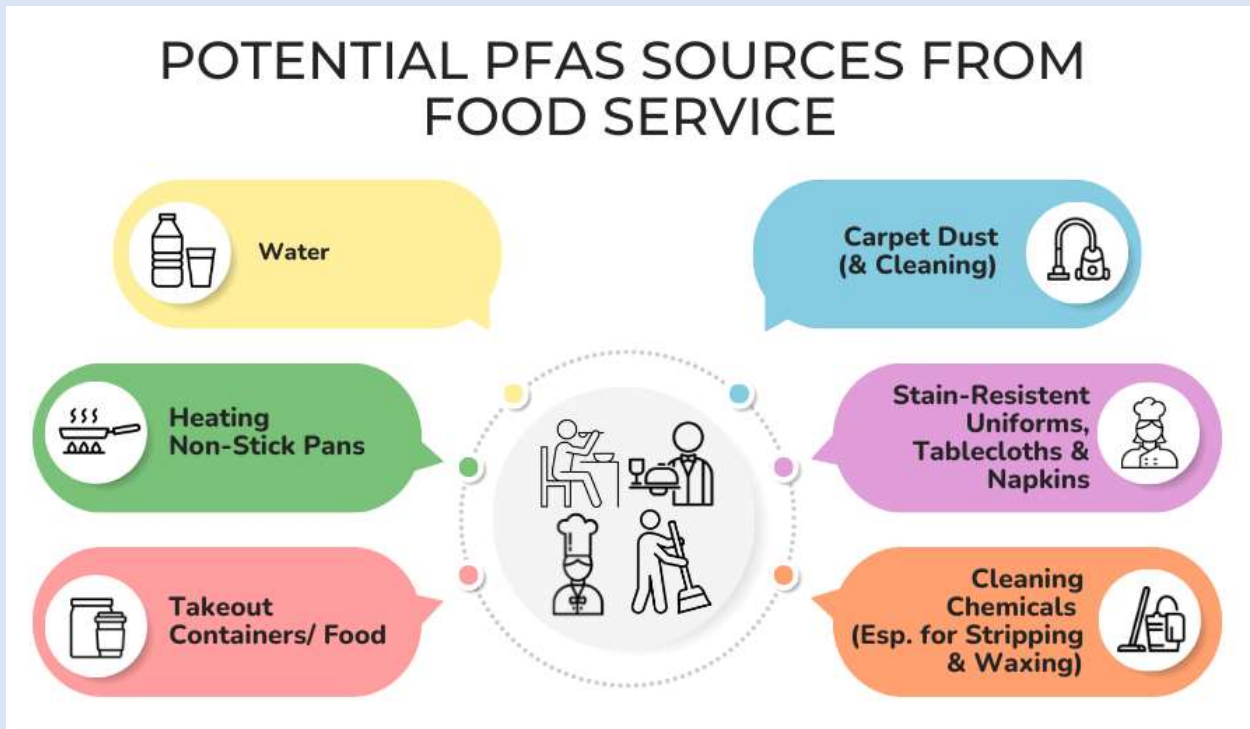
Water-Resistant/Waterproof

Oil/Grease-Resistant

Stain-Resistant/Stain-proof/Stain Release

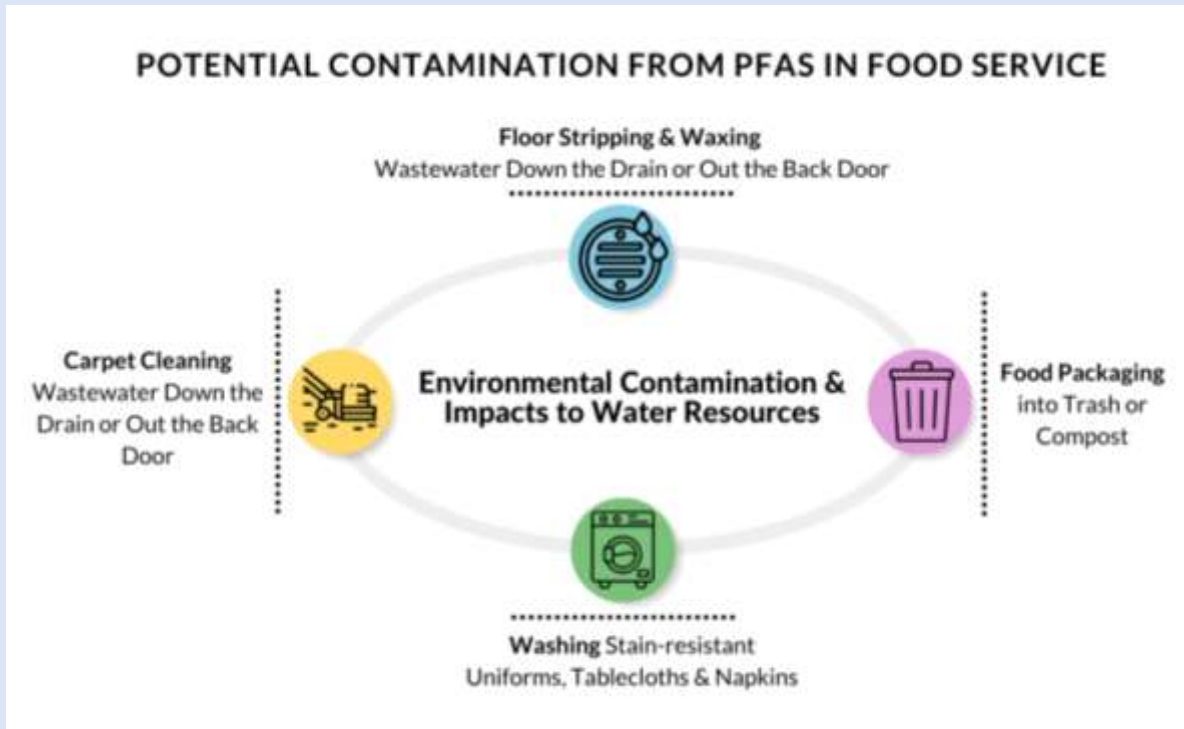
# PFAS in Food Service: Potential Exposure

## POTENTIAL PFAS SOURCES FROM FOOD SERVICE



Understanding which products likely contain PFAS and how to avoid purchasing them helps reduce worker and consumer exposure and decrease the amount of PFAS in the environment!

# PFAS in Food Service: Potential Contamination



Wastewater and trash containing PFAS can lead to potential environmental contamination that impacts water resources. Choose PFAS-free cleaning methods and reduce use of PFAS products!

# Where are PFAS in Food Packaging?

- Many disposable dinnerware and packaging items are coated in PFAS to achieve water-, oil-, and grease-resistance
  - Increase durability and appearance
- Examples of packaging that may include PFAS:
  - Food contact papers like bags, wraps & liners
  - Disposable dinnerware like plates, bowls, food boats & trays
  - Takeout containers such as pizza boxes, clamshells, paper cartons and interlocking food cartons



# PFAS in Food Packaging & Exposure

- PFAS can transfer from packaging to food
- Multiple disposal pathways may lead to PFAS entering the environment:
  - Disposed in a landfill = PFAS enter the leachate
  - Disposed in compost = some PFAS remain in the compost when it is land-applied
  - Disposal in recycling = PFAS enter the waste disposal and/or discharge during the remanufacturing process
- Primary methods of human exposure:
  - Direct consumption
  - Drinking water impacted from PFAS entering environment




**Note: Higher temperatures and longer durations of time can lead to greater amounts of PFAS in food**



# Be Aware of Green Messaging!

Many molded fiber and recycled paper disposable tableware are being advertised as “greener” and “compostable” but are treated with chemicals such as PFAS to achieve water-, and grease-resistant properties. PFAS can be mixed into the paper pulp during manufacturing and be present without an obvious physical coating.

PFAS are frequently found in food packaging:

- A 2017 study found 46% of food contact papers and 20% of paperboard samples from fast food restaurants contained PFAS
  - Another study found 57% of disposable dinnerware products tested contained PFAS
- 





# WA State Dept. Of Ecology Study

## May 2021 PFAS in Food Packaging Alternatives

- Viable alternatives that meeting their strict human health and environmental impact safety criteria
- Similar technical performance, commercially available at a similar cost:
  - Wax-coated wraps & liners
  - Kaolin clay-coated & reusable plates
  - Reusable bowls
  - PLA Plastics & reusable trays
  - Kaolin clay-coated & reusable food boats
  - Uncoated paper pizza boxes
  - PLA-coated french fry cartons



### Per- and Polyfluoroalkyl Substances in Food Packaging Alternatives Assessment

Developed under  
Chapter 70A.222.070 RCW

Hazardous Waste and Toxics Reduction Program

Washington State Department of Ecology  
Olympia, Washington

Revised May 2021, Publication 21-04-004



DEPARTMENT OF  
ECOLOGY  
State of Washington

# What You Can Do:

- Look for “No/Low F”  
Listed Products in the list  
compiled by the Center  
for Environmental Health
- Look for GreenScreen-  
Certified Products
- Look for BPI-Certified  
Compostable Products

- If not using only BPI-Certified  
Products, Compost ONLY  
Food Waste
- Choose Reusable  
Containers



# When Disposable is the Only Realistic Option

- Choose disposable materials that are wax-coated or truly uncoated
- Choose products that do not advertise oil-, grease-, and water-resistant claims
- Avoid disposable products that consistently test positive for PFAS such as molded fiber products and molded recycled paper products



# PFAS in Cookware and Exposure

- PFAS can transfer from cookware to food
- Multiple disposal pathways may lead to PFAS entering the environment:
  - Scratched cookware washed in sink = PFAS discharged into water
  - Disposed in a landfill = PFAS enter the leachate
- Primary methods of human exposure:
  - Direct consumption (food)
  - Breathing vapors from overheated cookware
  - Drinking water impacted from PFAS entering environment



**Note: Higher temperatures and longer durations of time can lead to greater amounts of PFAS in food**

# Be Skeptical!

## PFAS-Free Claims

Some companies state that their products are “PFC-free” or “PFOA-free” or “PFOS-free”, but such statements only cover some specific PFAS chemicals and they are likely still using different PFAS in their products. Even if a website states a product is PFAS-free that doesn’t mean it is!



Although one particular PFAS chemical (PFOA) was banned in cookware in 2014, other PFAS including PTFE are still used

# What You Can Do:

## Use nonstick-free cookware

Such as stainless steel or cast-iron pots and pan



## Look for GreenScreen-certified products

Greenscreen maintains a database of its certified products

## If using nonstick cookware, only use low to medium heat!

Lower heat and avoiding surface scratches helps reduce the likelihood of PFAS exposures and release into the environment



# PFAS in Textiles and Exposure

- Examples of textiles that may include PFAS:
  - Uniforms, tablecloths, napkins, upholstered chairs, booths & other furniture
- PFAS may enter the environment:
  - Washing textiles = PFAS discharged into wastewater
  - Disposed in a landfill = PFAS enter the leachate
- Primary methods of human exposure:
  - Drinking water impacted by wash water
  - **Breathing in and consuming dusts from treated fabrics**



**Note: The potential health impact from wearing PFAS-containing clothing while sweating in the hot conditions common to foodservice kitchens is unclear and further research is required**



# What You Can Do:

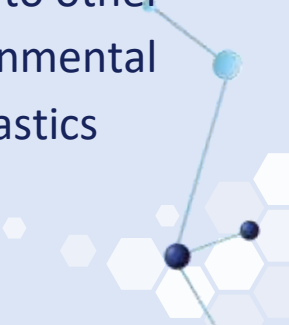
**Choose wood furniture with cushions rather than upholstered furniture**

**Don't buy uniforms, tablecloths, napkins or other textiles labeled as water-, stain-, or oil-resistant**

**Consider replacing suspected textiles with untreated alternatives**

Choose untreated natural fabrics such as cotton, hemp, or linen!

Avoid fabrics made of synthetic materials that contribute to other human health and environmental concerns such as microplastics






# PFAS in Carpets, Cleaning and Exposure

- Multiple disposal pathways may lead to PFAS entering the environment:
  - Wash water disposed of out the back door = direct discharge or PFAS into soil & eventually water
  - Wash water disposed of down the drain = PFAS discharged into septic system or wastewater treatment plant
  - Carpet disposed in a landfill = PFAS enter the leachate
- Primary methods of human exposure:
  - Drinking water impacted by wash water disposal
  - **Breathing in and consuming dusts from treated carpets and rugs**



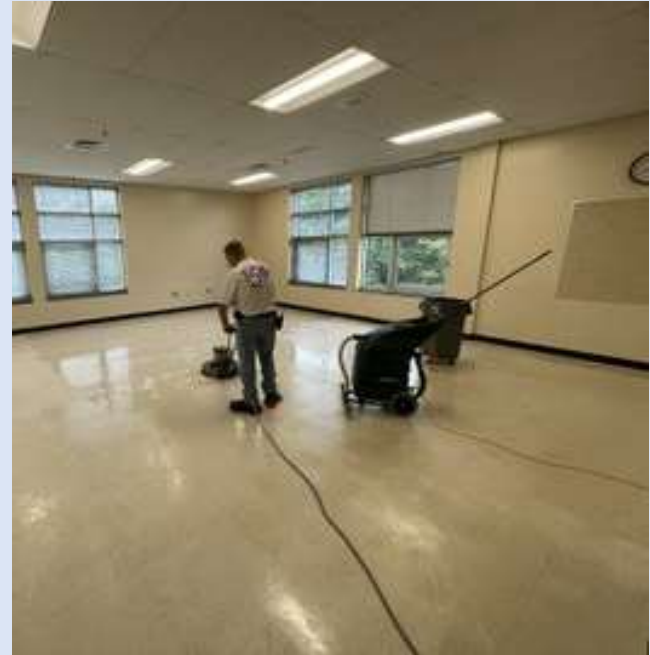


# What You Can Do:

1. Consider wood or tile flooring
  2. Opt for new carpet without water-, stain-, or oil-resistant properties
  3. Frequently vacuum carpet containing PFAS with a HEPA-filter
  4. Try to spot treat carpet/rugs rather than wash the entire area
  5. Make sure the carpet cleaning product does not contain PFAS
  6. Never dispose of wash water from carpet cleaning out the back door
  7. If on a septic system, collect and dispose of wash water at a wastewater treatment facility
- 

# PFAS Exposure in Floor Stripping & Waxing


- Multiple disposal pathways may lead to PFAS entering the environment:
  - Wastewater disposed of out the back door = direct discharge of PFAS to soil & eventually water
  - Wastewater disposed of down the drain = PFAS discharged into septic system or wastewater treatment plant
- Primary methods of human exposure:
  - Drinking water impacted by wastewater disposal
  - Levels in air might be concerning for worker exposure






# PFAS in Floor Stripping, Washing & Waxing

## A NH DES Study at Four Schools (published in February 2024):

- PFAS found at high levels in wastewater from floor stripping **at all four schools**
  - PFAS lower but still significant levels in the wastewater generated from routine floor cleaning
  - Floor stripper and finish products were tested and found to contain high levels of PFAS
  - Disposal of wastewater from floor stripping and finishing are **likely to have contributed to the contamination of groundwater that the schools use for drinking water** (all four schools are on septic)
- 



# What You Can Do:

1. Avoid floor cleaning – dry sweep as much as possible
  2. To the extent feasible, clean floors with plain water
  3. Make sure floor stripping, finishing & cleaning products do not contain PFAS
  4. Never dispose of wastewater from floor stripping & waxing out the back door
  5. If on a septic system, collect and dispose of wastewater at a wastewater treatment facility
- 



# PFAS in Food Service Guide



## What Are PFAS?

Per- and Polyfluoroalkyl Substances (PFAS) are a large group of human-made chemicals known for their heat-stable, friction-reducing, and water- and stain-resistant properties. PFAS have been added to many industrial and consumer products since the 1940s and there are thousands of different PFAS chemicals in use today. **PFAS are frequently called "forever chemicals" because they do not breakdown and build up over time in the environment, animals, and people.**

PFAS are used in many categories of products that a food service facility might use:

- **Food packaging** such as takeout & other disposable containers
- **Non-stick cookware**
- **Textiles** such as uniforms, tablecloths, napkins, and upholstered furniture
- **Carpets & cleaning**
- **Floor cleaning**, stripping & waxing

Each of these is discussed further in this guide.

Understanding which products are likely to contain PFAS and how to avoid buying them helps reduce worker and customer exposure and decreases the amount of PFAS entering the environment and drinking water supplies.



# USDA PFAS in Consumer Products Project

- Focused on consumer products and the impacts of PFAS on waste streams
- Purpose:
  - Help people learn about PFAS in the environment and waste streams
  - Show people how to avoid purchasing products containing PFAS





# USDA PFAS in Consumer Products Project

What we've completed so far:

**05**

## Factsheets

Covering:

- Why Care about PFAS
- Clothing & Other

Textiles

- Personal Care Products
- Outdoor Recreation
- Foodware & Packaging

**06**

## Outreach Events

Summer 2023:

- Tabled at two farmers markets each in ME & NH

In the NEK:

- Lyndonville Farmer Market
- Recycling Center

**01**

## Guide for Food Service

A Guide that shows what items might contain PFAS & how establishments may contribute to human exposure & contamination of the environment





# Overview Factsheet: Why Should I Care?

## Key Takeaways:

- Factsheet addresses exposure, health effects and potential environmental impact
- Children can experience heightened exposure to PFAS due to hand to mouth ingestion and close contact with carpeting/rugs causing inhalation of PFAS-containing dusts

## What You Can Do:

- Check labels, read ingredients, and be aware that PFAS are considered proprietary ingredients and manufacturers often do not disclose their use



**What are PFAS & Why Should I Care?**

Per- and Polyfluoroalkyl Substances (PFAS) are a large group of human-made chemicals known for their heat-stable, frost-resistant, and water-, grease-, and stain-resistant properties. PFAS have been added to many industrial and consumer products since the 1940s and there are thousands of different PFAS chemicals in use today. PFAS move easily in the environment and can be found in our water, food, soil, and air, often far away from where they were made or used by industry. PFAS are frequently called "forever chemicals" because they do not break down and build up over time in the environment, animals, and people.

There are many sources of PFAS in the environment. **This fact sheet focuses on use and disposal of PFAS-containing Consumer Products.** Understanding which products are likely to contain PFAS and how to avoid/limit them, helps reduce your personal exposure and decreases the amount of PFAS entering the environment and drinking water supplies.

**How Are People Exposed to PFAS?**

A recent study\* conducted by the U.S. Centers for Disease Control and Prevention (CDC) found that most people have PFAS in their body.

- The main exposure routes are ingestion of food and water and inhalation of dust that contain PFAS
- PFAS can be harmful to human health, particularly if someone is exposed to high levels for an extended period of time
- PFAS are normally absorbed by skin so tanning salons or water containing PFAS does not present a significant risk
- The potential health impact from the application of PFAS-containing personal care products on the skin is unclear and further research is required

**What Are the Health Effects?**

Scientists have found exposure to PFAS can cause many effects, including:

- Reduced immune system function
- Increased cholesterol levels
- Increased risk of pre-eclampsia in pregnant women
- Increased thyroid disorders and other hormonal disruption
- Increased risk of liver, kidney, prostate, and testicular cancer

Due to the thousands of different PFAS chemicals, assessing the risk of each compound or combination of compounds, or human health is difficult to assess. Scientists are still studying the health effects of exposure to the vast majority of PFAS chemicals and future studies may change our understanding of PFAS impacts on human health.

\*NORMAN is an Equal Opportunity Provider and Employer

***Want to limit PFAS exposure?  
Reduce the number of PFAS-containing products you purchase!***

# Four Product Category Factsheets



## PFAS in Clothing & Other Textiles:

**What you should know:**

Per- and Polyfluoroalkyl Substances (PFAS) are a group of human-made chemicals that build up over time in the environment, animals, and humans, and can be harmful to health. Understanding which products are likely to contain PFAS and how to avoid buying them helps reduce your personal exposure and decreases the amount of PFAS entering the environment and ending near supplies. For an introduction to PFAS, read the What are PFAS & Why Should I Care? factsheet.

Many fabrics are treated with PFAS to achieve durability and water- and stain-resistant qualities. You typically need to clean or wash surface long enough (PFAS). Examples of fabrics that might contain PFAS include:

- Clothing
- Bedding
- Upholstery
- Window & shower curtains
- Lighted/luminous fabrics
- Bag & carrying

**Health Risks:**

In general, items making the following claims are likely to contain PFAS:

- Waterproof, water-resistant or stain-resistant
- Breathable, waterproof and stain resistant

When PFAS-containing clothing and other textiles are washed, some of the PFAS come off and into the wash water that is discharged from your home. If you have a septic system, the wastewater is discharged before ground where it can contaminate the groundwater. If your home is on a sewer system, the wastewater plant cannot remove PFAS until it enters the environment.

**Additional Concerns for Children:**

- PFAS is present in other textiles commonly used for children. They are an increased hazard for children because they are closer to the surface on their skin and they can touch their mouth when they touch their hands.
- Clothing or bedding may lead to higher exposure for children if they put PFAS-treated articles in their mouth.

**Notes of Thanks:**

In general, items making the following claims are likely to contain PFAS:

- Dry clean, stain and water resistant
- Stain-resistant, water-resistant, and water-repellent

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## PFAS in Foodware & Packaging:

**What you should know:**

Per- and Polyfluoroalkyl Substances (PFAS) are a group of human-made chemicals that build up over time in the environment, animals, and humans, and can be harmful to health. Understanding which products are likely to contain PFAS and how to avoid buying them helps reduce your personal exposure and decreases the amount of PFAS entering the environment and ending near supplies. For an introduction to PFAS, read the What are PFAS & Why Should I Care? factsheet.

Many foodware and food packaging are treated with PFAS to achieve water- and stain-resistant qualities. Examples of packaging and foodware that may contain PFAS include:

- Disposable foodware
- Paper plates & disposable containers
- Coated food packaging
- Baking bags
- Flour liners & release coatings

When PFAS-containing foodware and packaging are used, some PFAS can transfer to food leading to direct consumption of PFAS. Note that higher temperatures and longer exposure of time can lead to greater amounts of PFAS to food. Once PFAS-treated products are heated, they enter a harmful endocrine pathway for PFAS to enter the environment. When PFAS-containing paper and fiber products are composted, PFAS remains in the compost and enters the environment when it is used.

**Notes of Thanks:**

In general, items making the following claims are likely to contain PFAS:

- Dry clean, stain and water resistant
- Stain-resistant, water-resistant, and water-repellent

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## PFAS in Outdoor Recreation:

**What you should know:**

Per- and Polyfluoroalkyl Substances (PFAS) are a group of human-made chemicals that build up over time in the environment, animals, and humans, and can be harmful to health. Understanding which products are likely to contain PFAS and how to avoid buying them helps reduce your personal exposure and decreases the amount of PFAS entering the environment and ending near supplies. For an introduction to PFAS, read the What are PFAS & Why Should I Care? factsheet.

Outdoor recreation products are treated with PFAS to achieve water- and stain-resistant qualities. Examples of outdoor recreation products that might contain PFAS include:

- Bikes (tires)
- Boots, shoes & gear pockets
- Rain gear & other outdoor clothing
- Ski, snow, ice, and snow & frost-free gear
- Tents
- Backpacks

**Notes of Thanks:**

In general, items making the following claims are likely to contain PFAS:

- Waterproof, water-resistant or stain-resistant

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## PFAS in Personal Care Products:

**What you should know:**

Per- and Polyfluoroalkyl Substances (PFAS) are a group of human-made chemicals that build up over time in the environment, animals, and humans, and can be harmful to health. Understanding which products are likely to contain PFAS and how to avoid buying them helps reduce your personal exposure and decreases the amount of PFAS entering the environment and ending near supplies. For an introduction to PFAS, read the What are PFAS & Why Should I Care? factsheet.

Many personal care products include PFAS to achieve durability and water-resistant qualities. Products that might contain PFAS include:

- Cosmetics
- Sunscreen & body lotion
- Dental floss
- Nail polish
- Hair care products
- Diapers & baby wipes

**Notes of Thanks:**

In general, items making the following claims are likely to contain PFAS:

- Waterproof, water-resistant or stain-resistant
- Long-lasting, smudge-free, or smudge-resistant

**Additional Concerns:**

Some are concerned about PFAS in personal care products because we don't know the health effects of long-term, repeated PFAS exposure. PFAS, lipsticks and other products used consistently may lead to other contamination of PFAS.

Many types of cosmetics contain PFAS including foundation, mascara, lip products, sunscreen, and eye products. PFAS are added to increase durability and waterproofness, achieve waterproof qualities, and change product texture. If you're considering the health and safety of your health, avoid PFAS lipsticks and eye products and avoid PFAS eye products. If you have a septic system, the wastewater plant cannot remove PFAS until it enters the environment.

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All factsheets can be found at [www.newmoa.org/projects/pfas-in-consumer-products/](http://www.newmoa.org/projects/pfas-in-consumer-products/)



# Vermont Bans PFAS in Products

Act 36 adopted in 2021 (taking effect in 2023):

- firefighting foam
- food packaging
- ski wax
- residential carpets and rugs, and their aftermarket stain or water-resistant treatments

New Bill signed by the Governor May 30, 2024:

Taking effect in 2026:

- Clothing
- Makeup
- Menstrual & incontinence products
- Non-stick cookware


In 2028: Synthetic Turf



# Upcoming Project Activities

## Hands-on Technical Assistance at a School in VT

If you would like to be considered for a free technical assistance visit, please contact Jennifer at [jgriffith@newmoa.org](mailto:jgriffith@newmoa.org)





# **“After” Poll Questions**

**Thank you for your cooperation!**



# Thank you!

Any questions?

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