



# The Summits of Healthier Products, People, & Planet

Arlene Blum  
Green Science Policy Institute













# Brominated Tris Flame Retardant

Tris (2,3-dibromopropyl) phosphate

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- In children's sleepwear 1975 to 1977
- Up to 10% of the weight of fabric
- In children's urine
- Mutagen and possible carcinogen















**THE  
MUTANTS**

Science, January 7, 1977

# **Flame-Retardant Additives as Possible Cancer Hazards**

**The main flame retardant in children's pajamas is a  
mutagen and should not be used.**

**Arlene Blum and Bruce N. Ames**



U.S. Consumer Product  
Safety Commission

# CPSC Bans TRIS-Treated Children's Garments

April 7, 1977

Chlorinated Tris (TDCPP) replaced Brominated Tris

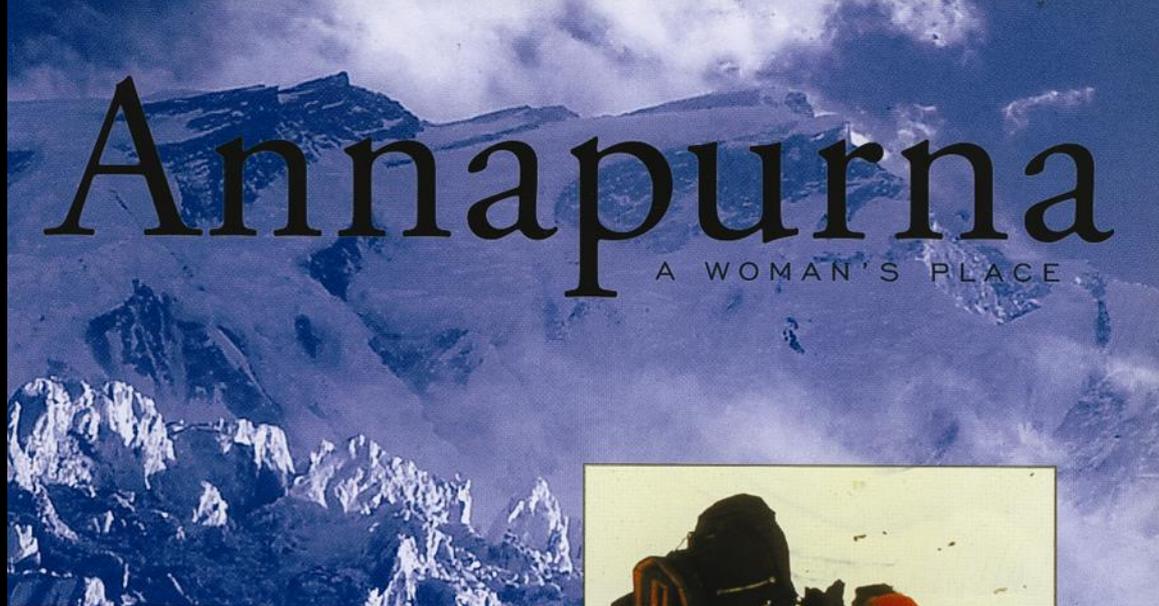
- removed from children's PJ's in 1977
- used furniture until 2012





# Annapurna

A WOMAN'S PLACE



The dramatic  
story of the first  
American ascent of  
one of the world's  
highest peaks



ARLENE BLUM

20TH ANNIVERSARY EDITION

With a new Preface and Afterword by the author

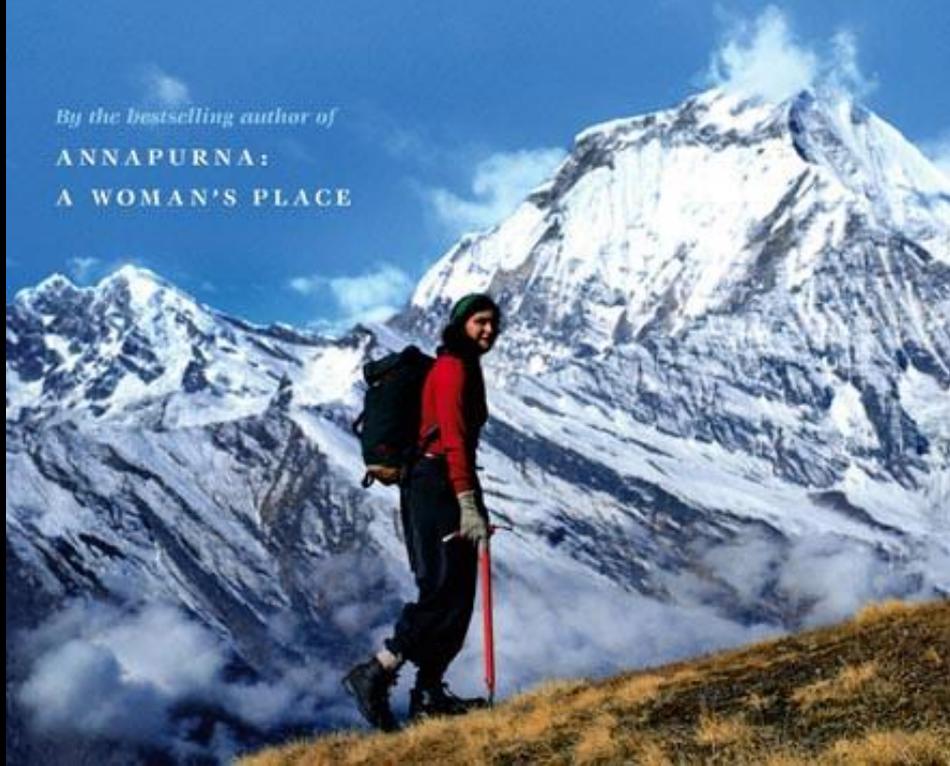
Arlene Blum

# BREAKING TRAIL

*A Climbing Life*

*By the bestselling author of*

**ANNAPURNA:  
A WOMAN'S PLACE**





# GREEN SCIENCE POLICY INSTITUTE

**ENVIRONMENTAL SCIENCE & TECHNOLOGY**

**ENVIRONMENTAL LETTERS**

**Building insulation: ...ing codes**

**Novel and High Volume Use Flame Retardants in US Couches**

**Fluorinated High Volume Use Flame Retardants in US Couches**

**Detection of Poly- and Perfluoroalkyl Substances (PFASs) in U.S. Drinking Water Linked to Industrial Sites, Military Fire Training Areas, and Wastewater Treatment Plants**

**Supporting Information**

**ABSTRACT:** Drinking water contamination with poly- and perfluoroalkyl substances (PFASs) poses risks to the developmental, immune, metabolic, and endocrine health of consumers. We present a spatial analysis of 2013–2015 national drinking water PFAS concentrations from the U.S. Environmental Protection Agency's (U.S. EPA) third Unregulated Contaminant Monitoring Rule (UCMR3) program. The number of industrial sites that manufacture or use these compounds, the number of military fire training areas, and the number of wastewater treatment plants are all significant



## Education



## Research

## Retreats

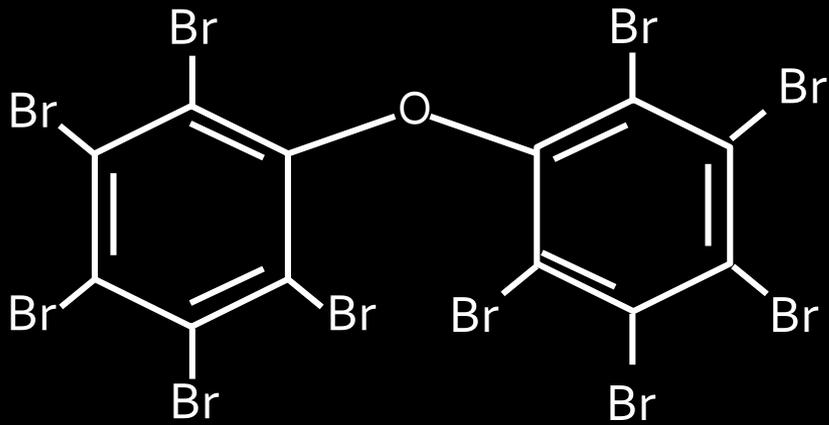
# Policy & Purchasing Change

# U.S. Toxic Substances Control Act (1976)

- 62,000 previous chemicals “grandfathered”
- 23,000 new chemicals
  - 85% have no health data
  - 67% have no data at all



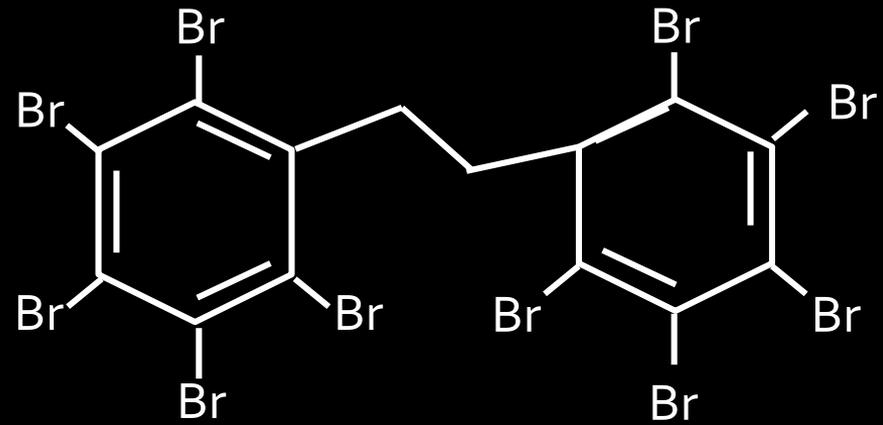
# Regrettable Substitution



Decabromodiphenyl  
ether

Concerns:

- Persistence
- Bioaccumulation
- Toxicity



Decabromodiphenyl  
ethane

Concerns:

- Persistence
- Bioaccumulation
- Toxicity

A large, dense pile of multi-colored jelly beans in various colors including red, orange, yellow, green, blue, purple, pink, and brown. The text is overlaid on the center of the image.

**EVALUATING TENS OF THOUSANDS OF  
INDIVIDUAL CHEMICALS IS UNWORKABLE**



BUT ADDRESSING **SIX GROUPS** OF  
CHEMICALS OF CONCERN IS MANAGEABLE



# Six Classes Videos

1

PFAS (Highly Fluorinated)



2

Antimicrobials



3

Flame Retardants



4

Bisphenols + Phthalates



5

Some Solvents



6

Certain Metals



[www.SixClasses.org](http://www.SixClasses.org)

Healthier products, healthier people in four minutes!

Is it necessary?

Is it worth it?

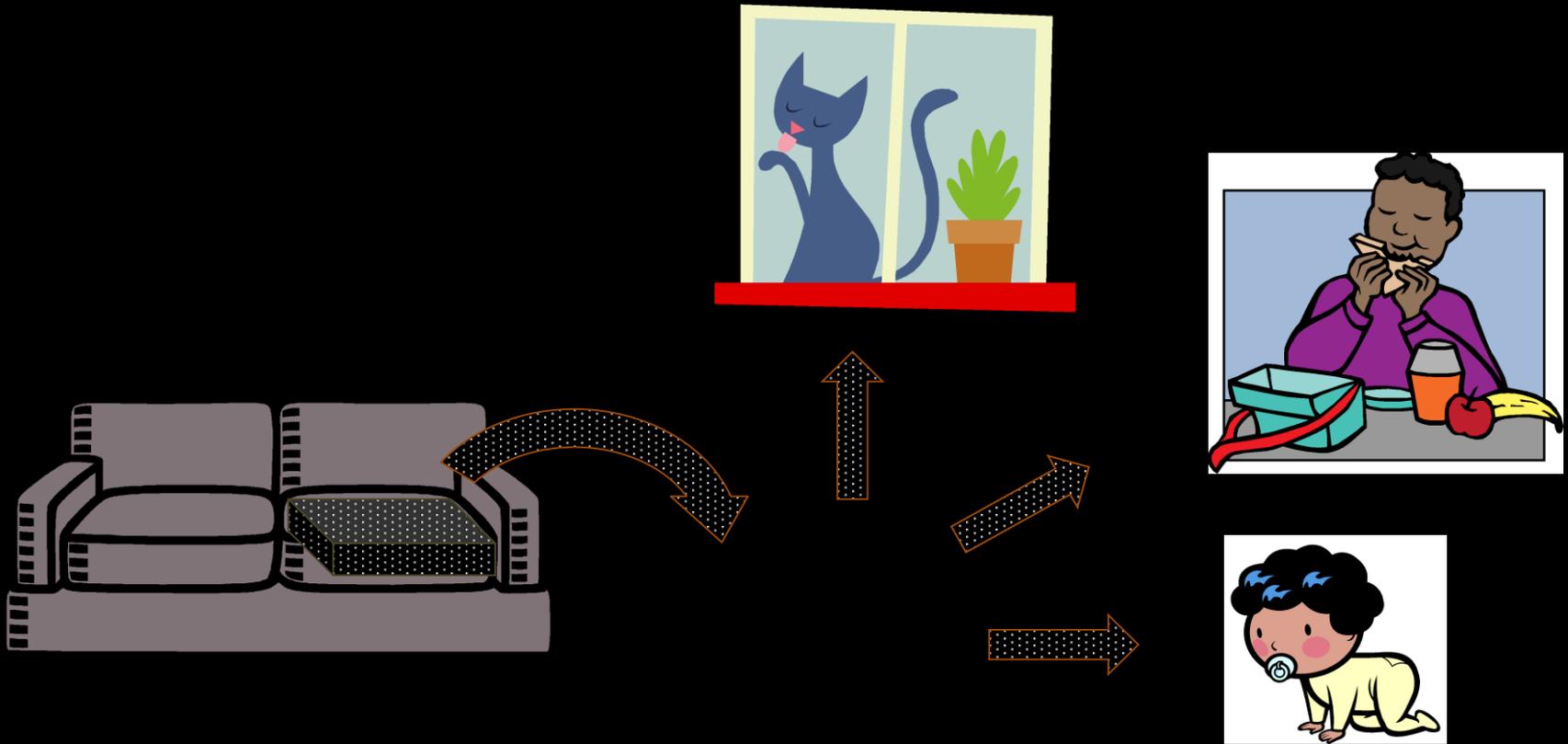
Is there a safer alternative?

# Flame retardants

## Updating 1970s Flammability Standards

- Children's sleepwear –1977
- Furniture and baby product foam --2014
- Foam building insulation
- Electronics cases

# From Products to People



# Furniture foam flame retardant (PentaBDE) associations with human health problems



Increased time to pregnancy  
Altered thyroid hormone  
Thyroid disease in women

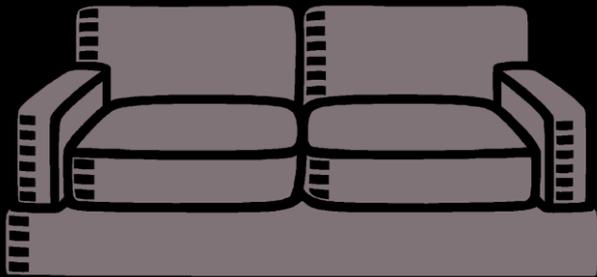


Impaired attention  
Poorer coordination  
Lower IQ  
Developmental toxicity  
Baby boys' genital problems  
Lower birth weight  
Delayed puberty in girls  
Earlier puberty in boys

*Main et al. 2007; Goodyer et al 2017;  
Eskenazi et al., 2010, 2011, 2012; Herbstman et  
al. 2010; Makey et al. 2016; Windham et al.  
2015; Harley et al. 2017; Allen et al. 2016*

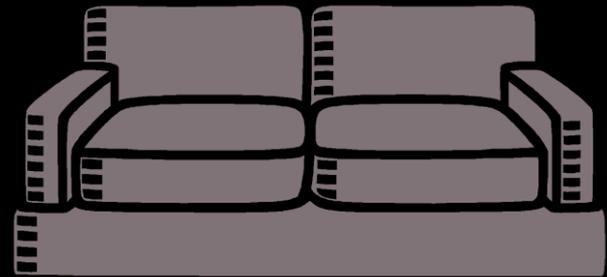
# TB117 Fire Safety Benefit?

TB117 foam



~

Non - TB117 foam

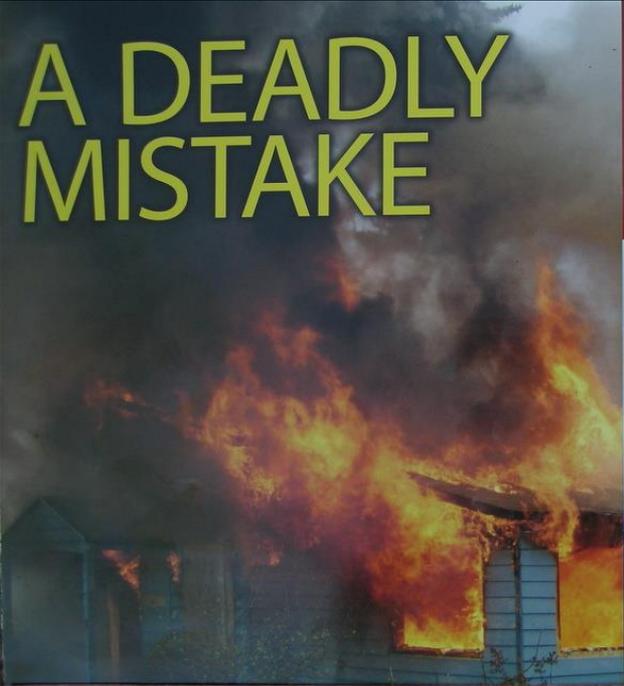


“No significant, consistent difference...”

# Increased fire safety without flame retardants



Assembly Bill 706, Senate Bill 772, Senate Bill 1291, Senate Bill 147



**A DEADLY MISTAKE**

Help stop the bill that will ban material used to make flame resistant products.

CALL YOUR STATE SENATOR TODAY AND TELL THEM TO **VOTE NO ON AB 706**

Call State Senator **Tom Torlakson** at **916-651-4007** and tell him to **VOTE NO** on AB 706.



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**DON'T LET THE SACRAMENTO POLITICIANS BAN THE USE OF PROVEN FLAME RETARDANTS-IT COULD BE A DEADLY MISTAKE**

## Paid for by Californians for Fire Safety:

- Albemarle
- Chemtura
- Israel Chemicals LTD (ICL)



## TRIBUNE WATCHDOG

# Playing with fire

A deceptive campaign by industry brought toxic flame retardants into our homes and into our bodies. And the chemicals don't even work as promised.

BY PATRICIA CALLAHAN AND SAM ROE  
*Tribune reporters*

**D**r. David Heimbach knows how to tell a story. Before California lawmakers last year, the noted burn surgeon drew gasps from the crowd as he described a 7-week-old baby girl who was burned in a fire started by a candle while she lay on a pillow that lacked flame retardant chemicals.

"Now this is a tiny little person, no bigger than my Italian greyhound at home," said Heimbach, gesturing to approximate the baby's size. "Half of her body was severely burned. She ultimately died after about three weeks of pain and misery in the hospital."

Heimbach's passionate testimony about the baby's death made the long-term health concerns about flame retardants voiced by doctors, environmentalists and even firefighters sound abstract and petty.

But there was a problem with his testimony: It wasn't true. Records show there was no dangerous pillow or candle fire. The baby he described didn't exist.

Neither did the 9-week-old patient who Heimbach told California legislators died in a candle fire in 2009. Nor did the 6-week-old patient who he told Alaska lawmakers was fatally burned in her crib in 2010.

Heimbach is not just a prominent burn doctor. He is a star witness for the manufacturers of flame retardants.

His testimony, the Tribune found, is part of a decades-long campaign of deception that has loaded the furniture and electronics in American homes with pounds of toxic chemicals linked to cancer, neurological deficits, developmental problems and impaired fertility.

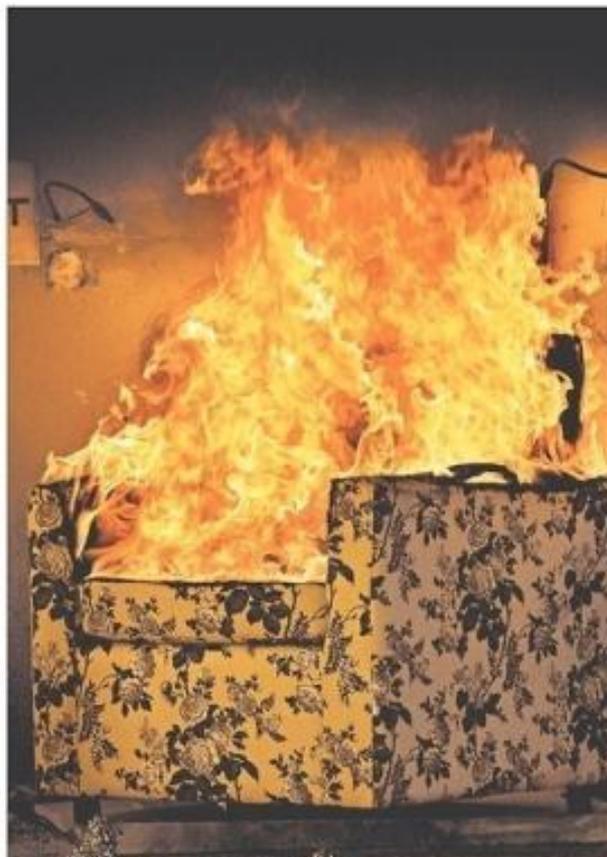
The tactics started with Big Tobacco, which wanted to shift focus away from cigarettes as the cause of fire deaths, and continued as chemical companies worked to preserve a lucrative market for their products, according to a Tribune review of thousands of government, scientific and internal industry

stoked the public's fear of fire and helped organize and steer an association of top fire officials that spent more than a decade campaigning for their cause.

Today, scientists know that some flame retardants escape from household products and settle in dust. That's why toddlers, who play on the floor and put things in their mouths, generally have far higher levels of these chemicals in their bodies than their parents.

Blood levels of certain widely used flame retardants doubled in adults every two to five years between 1970 and 2004. More recent studies show levels haven't declined in the U.S. even though some of the chemicals have been pulled from the market. A typical American baby is born with the highest recorded concentrations of flame retardants among infants in the world.

People might be willing to accept the health risks if the



Pulitzer Prize

Finalist

Goldsmith Prize

Investigative Reporting

Environmental

Journalists Society

Environmental Reporting

Gerald Loeb Award

Business and Financial Journalism

National Press Club

Consumer Award

# California TB117-2013

REQUIREMENTS FOR CALIFORNIA BUREAU OF FIRE PREVENTION, HOME FURNISHINGS AND APPLIANCES TECHNICAL BULLETIN 117-2013. CARE SHOULD BE EXERCISED NEAR OPEN FLAME OR WITH BURNING CIGARETTES.

THE UPHOLSTERY MATERIALS IN THIS PRODUCT:

- CONTAIN ADDED FLAME RETARDANT CHEMICALS
- CONTAIN NO ADDED FLAME RETARDANT CHEMICALS

THE STATE OF CALIFORNIA HAS UPDATED THE FLAMMABILITY STANDARD AND DETERMINED THAT THE FIRE SAFETY REQUIREMENTS FOR THIS PRODUCT CAN BE MET WITHOUT ADDING FLAME RETARDANT CHEMICALS. THE STATE HAS IDENTIFIED MANY FLAME RETARDANT CHEMICALS AS BEING KNOWN TO, OR STRONGLY SUSPECTED OF, ADVERSELY IMPACTING HUMAN HEALTH OR DEVELOPMENT.

# California Hall of Fame

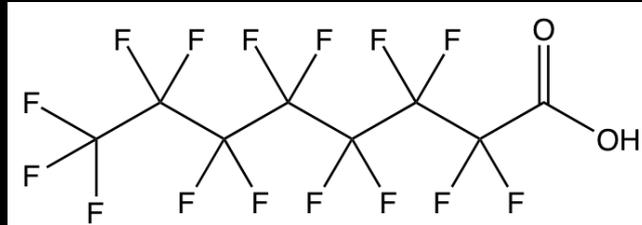


Robert Redford, Fernando Valenzuela, Ann Gust Brown, Jerry Brown, Arlene Blum, Thomas Keller, Ed Lee's daughter, Belva Davis, & Joan Baez.

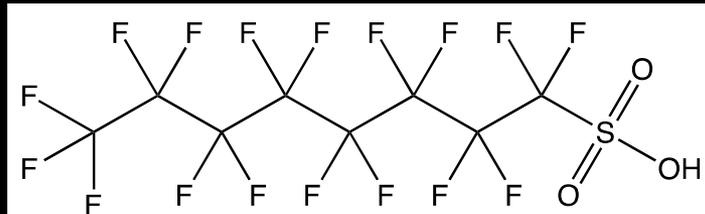
# Class 1 PFAS

(Per- and polyfluoroalkyl substances)

PFOA  
(C8)



PFOS  
(C8)

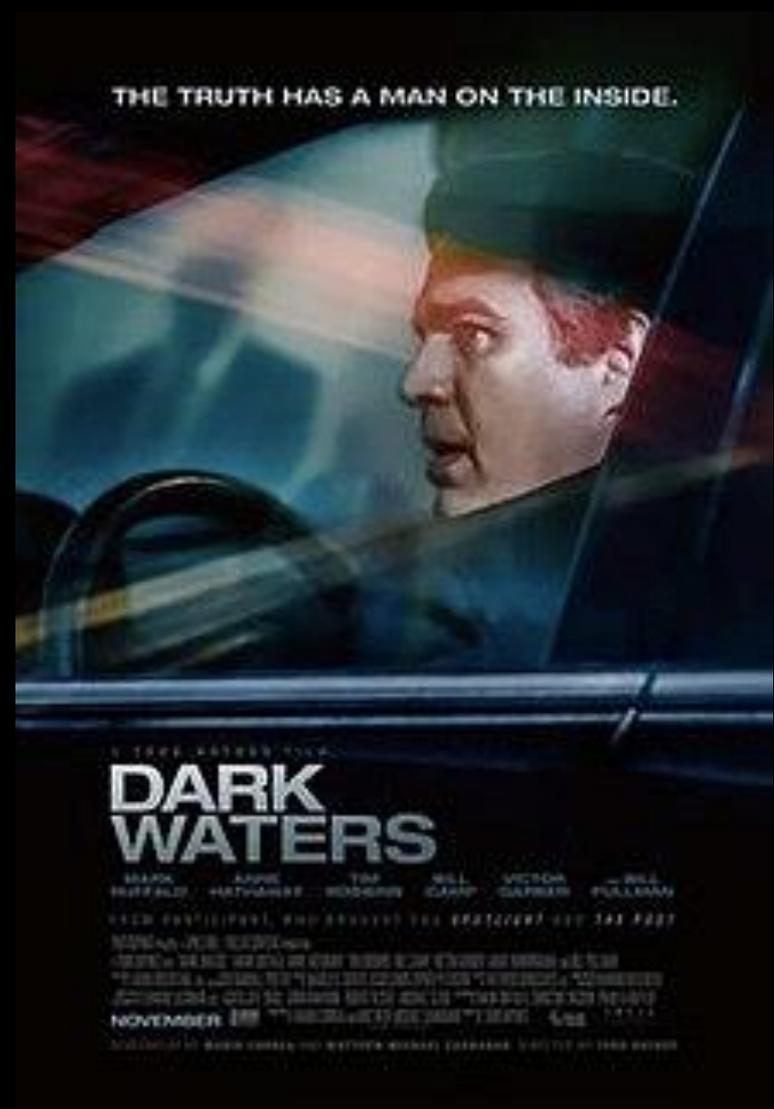


Carbon-Fluorine bond strength:

- Leads to oil and water repellency
- “Forever chemicals” -- last for geologic time!

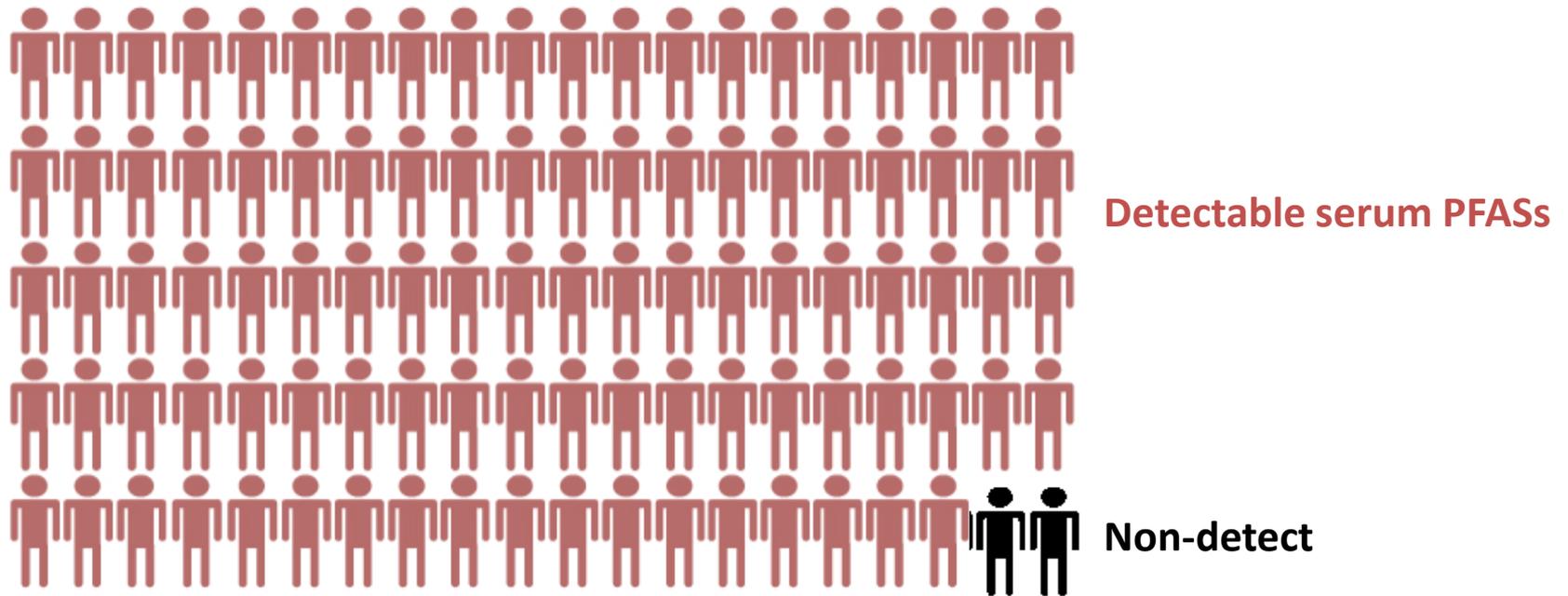
# Dark Waters film

- The story of attorney Rob Bilott, who uncovered massive PFOA contamination from a DuPont factory in WV



# PFAS exposure is a health concern

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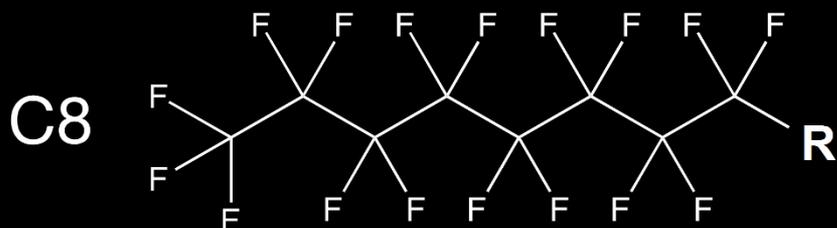
Exposure linked to health risks:

Cancer, elevated cholesterol, obesity, immune suppression, and endocrine disruption

Courtesy, Cindy Hu, Harvard University

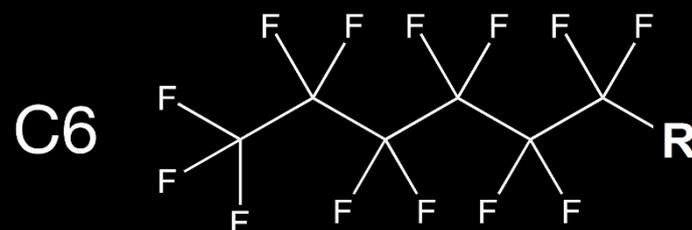
(Ref: Lewis et al., 2015; Grandjean et al., 2012; Braun et al., 2016; Barry et al., 2013)

# “Regrettable” Substitution?



## Long chain:

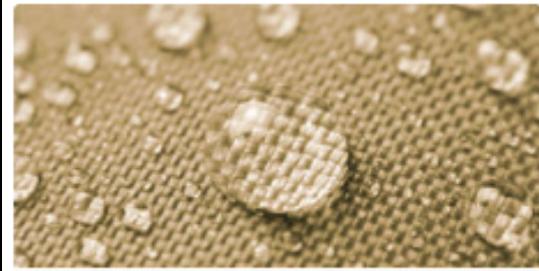
- Extreme persistence
- Bioaccumulation
- Toxicity



## Short chain:

- Extreme persistence
- Build-up in plants
- Suspected toxicity
- More mobile
- Clean up more difficult
- Harder to measure & monitor

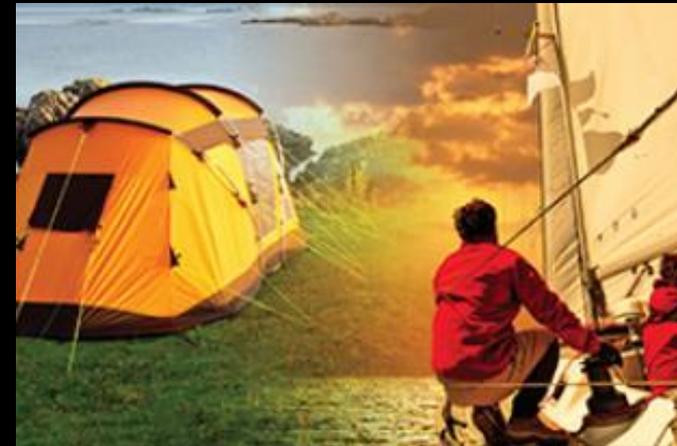
# AGC – THE FIRST COMPANY TO FULLY CONVERT TO PFOA-FREE\* WATER AND OIL REPELLENT



AsahiGuard® E Series is a fluorinated water and oil repellent providing sustainable alternatives for many applications, including paper packaging, textiles, apparel, non-wovens, natural and synthetic leathers and home furnishings based on proven AGC C6 chemistry. AsahiGuard E-Series offers high performance



C6 chemistry.



- “C6 polymers are proven safe for their intended use”
- “Evaluated by regulators, showing they are safe and effective”
- “C6 polymers cannot break down to C8”

# May 2015 The Madrid Statement on Highly Fluorinated Chemicals



“We call on the international community to cooperate in limiting the production and use of PFAS and in developing safer non-fluorinated alternatives.”

Signed by 230 scientists from 40 countries

2015: Environmental Health Perspectives

# 2015-16

The Opinion Pages | OP-ED COLUMNIST

The New York Times

## Chemicals in Your Popcorn?

JUNE 4, 2015



Nicholas Kristof

What do a pizza box, a polar bear and you have in common?

All carry a kind of industrial toxicant called poly- and perfluoroalkyl substances, or PFASs, that do two things: They make life convenient, and they also appear to increase the risk of cancer.

## These Chemicals in Pizza Boxes and Carpeting Last Forever

More than 200 scientists around the world document the threats of perfluorinated compounds and call for more government control.

By Lindsey Konkel, National Geographic  
PUBLISHED MAY 01, 2015



The Intercept

## THE TEFLON TOXIN

DuPont and the Chemistry of Deception



Sharon Lezner

Aug. 11 2015, 3:35 p.m.



133

Home

The New York Times Magazine

## The Lawyer Who Became DuPont's Worst Nightmare

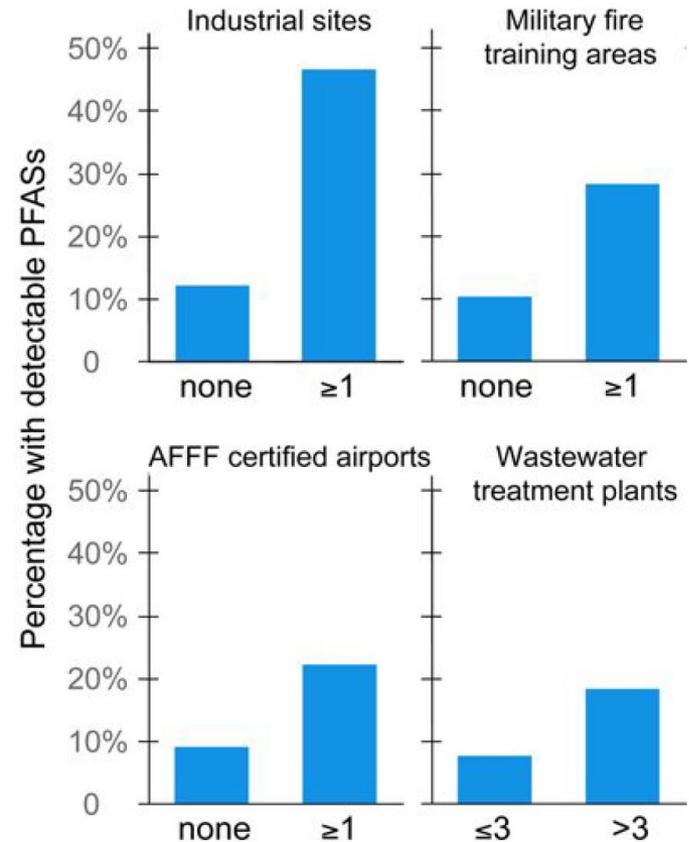
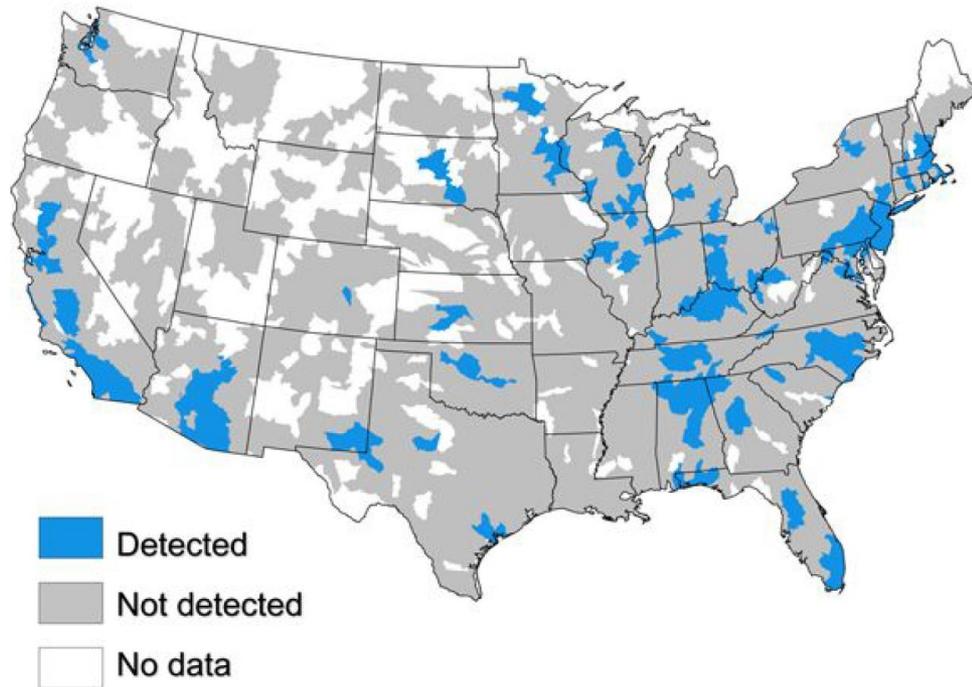
Rob Bilott was a corporate defense attorney for eight years. Then he took on an environmental suit that would upend his entire career — and expose a brazen, decades-long history of chemical pollution.

By NATHANIEL RICH JAN. 6, 2016

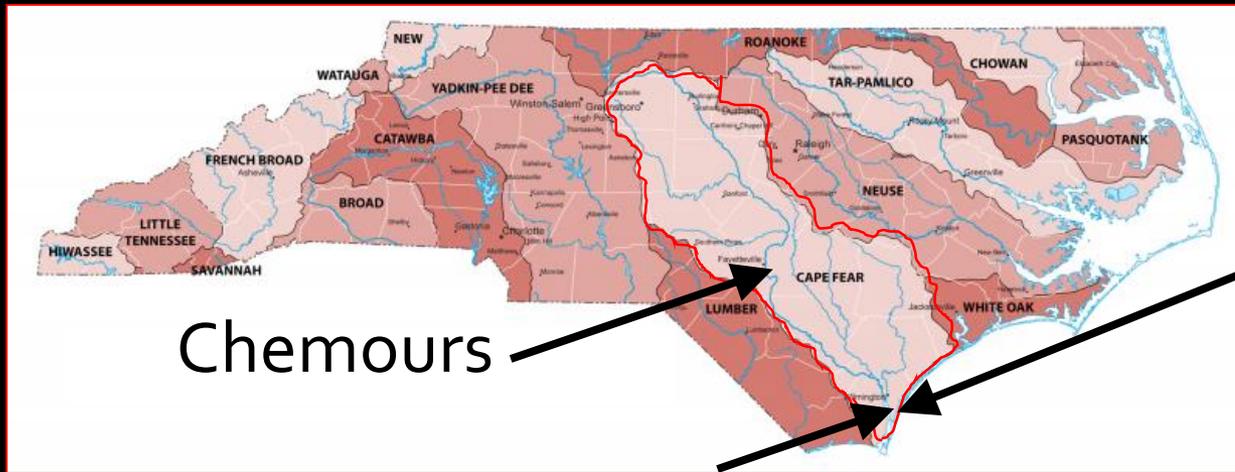


# EPA Lifetime Health Advisory Level: 70 ng/L PFOA + PFOS

## Hydrological units with detectable PFASs



# Water Treatment Costs: North Carolina



Chemours

Brunswick County:  
reverse osmosis  
filtration for 25,000  
customers:  
-\$99M to build  
-\$2.9M to operate

Cape Fear Public Utility Authority activated  
carbon filtration plant:

-\$46M to build

-\$2.7M to operate each year

Wilmington Star News,  
May 9<sup>th</sup> and 10<sup>th</sup>, 2018

# Colorado Springs

## Peterson Air Force Base

- Firefighting foam contaminated water supply of 70,000 residents



## PFOA+PFOS in drinking water up to 1,370 ppt

- 20x EPA Health Advisory Level

## PFHxS in residents blood 10x higher than national average

## El Paso County part of CDC study on PFAS health effects

PFAS are Problematic  
& Difficult to Clean Up

Prevention is Preferable!

# Fountain Valley Clean Water Coalition

Education, Empower the community, Change the Future to prevent contamination

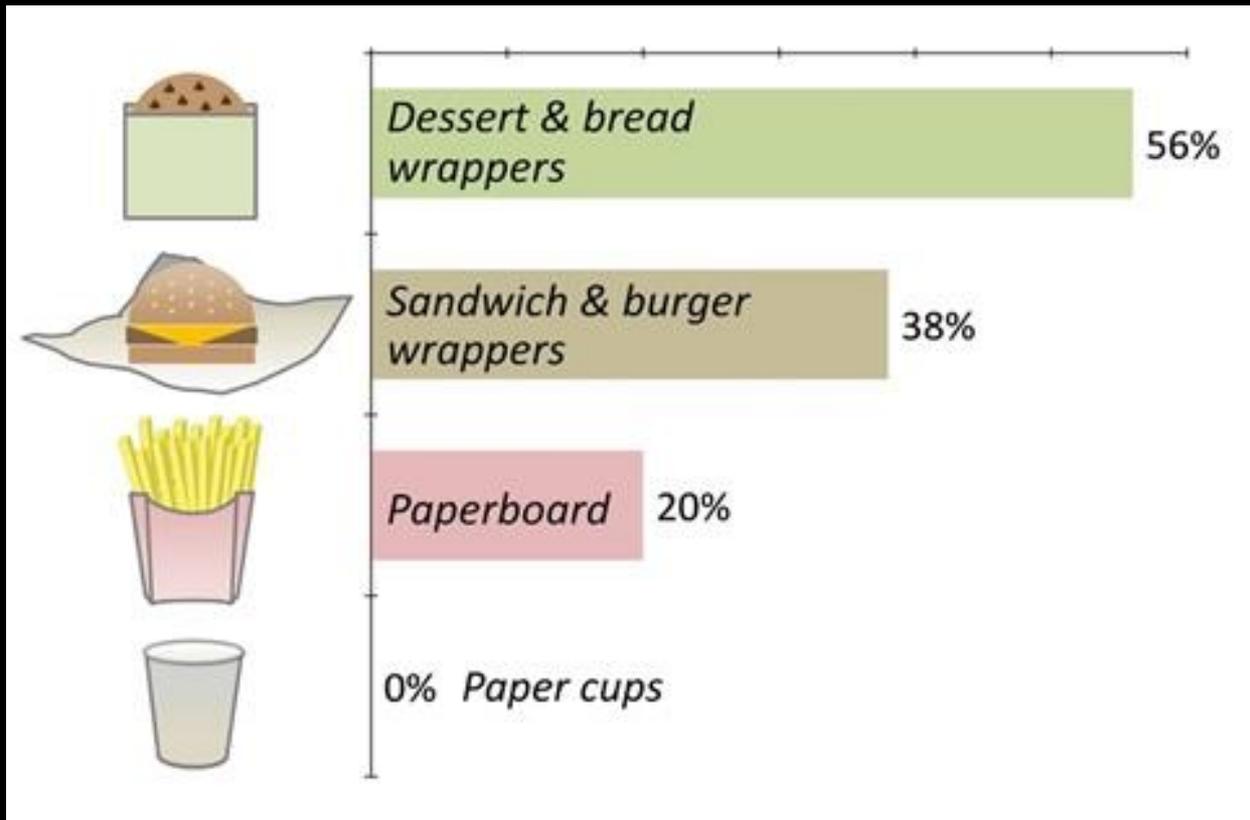
- Founded in 2016 by Liz Rosenbaum
- Hosts informational meetings
- Pushes for remediation
- Advocates for the prevention of further pollution



FVCWA's work has contributed both legislation and funding at the state and federal level

# Fluorine in U.S. fast food packaging paper

(percent positive; 400 products sampled)



Adopted from Schaidler L. 2016 *Fluorinated compounds in U.S. fast food packaging*.

Should these products be considered compostable?

**CNN** @CNN Follow

Researchers found fluorinated chemicals in one-third of the fast food packaging they tested, according to a report [cnn.it/2jWU6Rw](http://cnn.it/2jWU6Rw)



RETWEETS 237 LIKES 205

6:20 AM - 1 Feb 2017

**Washington Post** @washingtonpost Follow

Researchers find "another reason" to avoid fast food: Chemicals in the packaging



Researchers find 'another reason' to avoid fast food: Chemicals in the packa...  
Substances with links to health problems have been found in wrappers and containers, where they can leach into food.  
[washingtonpost.com](http://washingtonpost.com)

RETWEETS 141 LIKES 106

**Mother Jones** @MotherJones Follow

The Nasty Ingredient in Fast-Food Wrappers  
[mojo.ly/2jCPzA4](http://mojo.ly/2jCPzA4)



RETWEETS 19 LIKES 22

5:09 AM - 1 Feb 2017

**United States Senate**  
WASHINGTON, DC 20510

March 9, 2017

Mr. Daniel S. Schwartz  
Chief Executive Officer  
Restaurant Brands International Inc.  
226 Wycroft Road,  
Oakville, Ontario L6K 3X7,  
Canada

Dear Mr. Schwartz:

We write to inquire about Burger King's use of potentially harmful fluorinated chemicals in food wrappers, bags, boxes, or other kinds of food packaging. Per and polyfluoroalkyl substances (PFASs) represent a class of chemicals sometimes used in fast food packaging to prevent grease and sauces from seeping through packaging. These chemical compounds have been

# PFAS and Carpet

- PFAS-treated carpet linked to high PFAS blood levels

## Exceptionally High Serum Concentrations of Perfluorohexanesulfonate in a Canadian Family are Linked to Home Carpet Treatment Applications

Sanjay Beesoon,<sup>†</sup> Stephen J. Genuis,<sup>‡</sup> Jonathan P. Benskin,<sup>†,§</sup> and Jonathan W. Martin<sup>\*,†</sup>

<sup>†</sup>Division of Analytical and Environmental Toxicology, Department of Laboratory Medicine and Pathology, University of Alberta, Edmonton, AB, Canada

<sup>‡</sup>Department of Medicine, University of Alberta, Edmonton, AB, Canada

**S** Supporting Information

# Moving away from PFAS in carpet

- Major manufacturers phasing out PFAS
  - 2014 – Interface
  - 2017 – Tarkett
  - 2019 – Engineered Floors
  - 2019 – Shaw

## Home Depot plans to phase out selling rugs and carpets containing PFAS

By VIRGINIA GORDAN • SEP 17, 2019

[Share](#) [Tweet](#) [Email](#)



CREDIT ANDREI / ADOBE STOCK

The Home Depot announced Tuesday that it will stop buying from its suppliers any rugs and carpets that contain [PFAS chemicals](#).

"Excluding PFAS from the carpets and rugs we sell is another example of our shared commitment to building a better future for our customers and the planet,"

Ron Jarvis, The Home Depot's vice president for environmental innovation, said in a written statement.

Michigan Radio, Sept. 17, 2019

# BRANDS ARE ELIMINATING HIGHLY FLUORINATED CHEMICALS

IKEA

H&M

Crate&Barrel

LEVI STRAUSS & CO.

PUMA

benetton

ESPRIT

adidas

MARKS &  
SPENCER

MANGO

BURBERRY<sup>®</sup>  
LONDON

ZARA

# 2020 National Defense Authorization Act



- Require military to phase PFAS out of firefighting foams
- USGS nationwide water sampling
- Authorize Air Force to compensate for contaminated agricultural lands
- Prohibit fluorinated packaging in meals ready to eat

# Moving away from PFAS





## PFAS Central: sharing notable news, scientific papers & events



NEWS

### PFAS Chemicals to be Banned in Firefighting Foam Used on Military Bases

U.S. Senator Kirsten Gillibrand today announced that a provision she cosponsored to prohibit the Department of Defense from procuring firefighting foam that contains per- and polyfluoroalkyl substances (PFAS) passed the Senate Armed Services Committee as part of the annual National Defense Authorization Act (NDAA).

[LEARN MORE](#)



SCIENCE

### Larval amphibians rapidly bioaccumulate poly- and perfluoroalkyl substances.

Toxic frogs lead to bioaccumulation in predator species.

[LEARN MORE](#)



POLICY

### The Cost of Inaction: A socioeconomic analysis of environmental and health impacts linked to exposure to PFAS

A recent Nordic Council study, The Cost of Inaction: A socioeconomic analysis of environmental and health impacts linked to exposure to PFAS, estimates the very high cost of harm to human health and the environment from PFAS exposure in Europe.

[LEARN MORE](#)

Although useful, PFAS or highly fluorinated chemicals are associated with serious health harm and can remain in the environment forever.

[LEARN MORE](#)

# PFAS-Free Products

## PFAS-Free Products

We will be adding many more products to this list.

For more information about these products, click links and see footnotes.

### Carpet and Rugs



- [Engineered Floors](#) (all products, [policy](#))<sup>7</sup>
  - [Interface](#) (all products, [policy](#))<sup>7</sup>
  - [Shaw](#) (all products, [policy](#))<sup>7</sup>
  - [Tarkett](#) (all products, [policy](#))<sup>7</sup>
- 
- [Home Depot](#) (carpets and rugs, [policy as of 12/31/2019](#))
  - [Lowe's](#) (residential carpets and rugs, [policy as of 1/1/2020](#))

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### Outdoor Gear



#### Rain Gear:

- [Columbia](#) (Outdry Ex Eco products, [policy](#))
- [Endura](#) (select products, [policy](#))<sup>10</sup>
- [Jack Wolfskin](#) (all products, [policy](#))

# Six Classes Videos

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Bisphenols + Phthalates



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Some Solvents



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Certain Metals



[www.SixClasses.org](http://www.SixClasses.org)

Healthier products, healthier people in four minutes!

For monthly e-newsletters  
[www.SixClasses.org](http://www.SixClasses.org)



**By limiting use of the Six Classes**

**We can have a healthier world.**

**For more information:  
[GreenSciencePolicy.org](http://GreenSciencePolicy.org)**