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# PFAS – ‘A Forever Chemical’ (per- and poly-fluorinated alkyl substances)

***The Writing is on the Wall***  
**Preparing for the Future**

Society of Cosmetic Chemists – Ontario Chapter  
March 21, 2023



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## TODAY'S OBJECTIVES



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- Create awareness of emerging regulatory scrutiny on PFAS's as a class (both domestic and abroad)
- Through awareness, help formulators 'read the tea leaves' and identify possible R&D and reformulation needs in anticipation of emerging regulatory developments
- Initiate a proactive dialogue with upstream suppliers and formulators to prepare for possible classification of PFAS as persistent organic pollutants (POPs)



## SNAPSHOT IN PERSPECTIVE

### PFAS In the News



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### *Biden Administration to Restrict Cancer-Causing 'Forever Chemicals'*

Michael S. Regan, the administrator of the E.P.A., said the government intends to require near-zero levels of perfluoroalkyl and polyfluoroalkyl substances, part of a class of chemicals known as known as PFAS. Exposure to the chemicals has been linked to cancer, liver damage, fertility and thyroid problems, asthma and other health effects.

New York Times (nytimes.com) [March 14, 2023]

### *Toxic 'forever chemicals' found in toilet paper around the world*

All toilet paper from across the globe checked for toxic **PFAS** “forever chemicals” contained the compounds, and the waste flushed down toilets and sent to sewage treatment plants probably creates a significant source of water pollution, new research has found.

PFAS are a class of about 14,000 chemicals typically used to make thousands of consumer products resist water, stains and heat. They are called “forever chemicals” because they do not naturally break down, and they are linked to cancer, fetal complications, liver disease, kidney disease, autoimmune disorders and other serious health issues.

The Guardian (theguardian.com) [March 13, 2023]

# WHAT IS A PFAS?

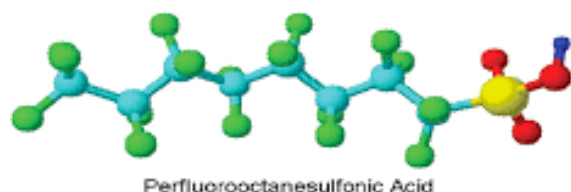
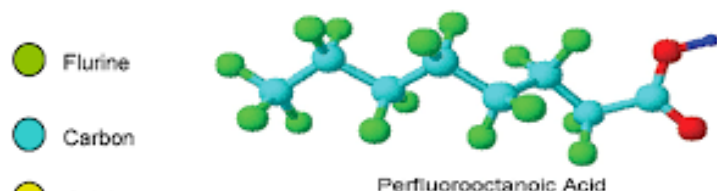
## PER- and POLY-FLUORINATED ALKYL SUBSTANCES



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### PFOA



### PFOS

Photo Credit: American Chemistry Society (ACS) [[www.acs.org](http://www.acs.org)]

### VERY LARGE CHEMICAL CLASS (1,000s+ to 10,000s+ substances)

- PFOA, PFOS, LC-PFCAs vs PFAS
- **NO** current regulatory consensus on scope/scale of group/class (subject to significant on-going domestic and global dialogue)
- Anthropogenic
- Environmental persistence
- Possible endocrine/reproductive and/or developmental toxicity (at least for some substances within the class)

**CURRENT "POSTER CHILD" OF MAN-MADE, NON-ESSENTIAL, 'CHEMICALS OF CONCERN'**

# WHAT IS A PFAS? [cont.]

## PER- and POLY-FLUORINATED ALKYL SUBSTANCES



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Photo Credit: City of Riverside California [<https://riversideca.gov>]

## WIDE DIVERSITY OF UBIQUITOUS USE ACROSS SECTORS

- Broad, multisectoral industry consensus
  - Not all PFASs are created equal (either from toxicological and/or environmental perspective)
  - Need a 'right-sized' approach that looks to delineate fluorinated chemistries that are differentiated from PFOA/PFOS/LC-PFCAs
  - Not guilty, simply by fluorinated association

## ➤ ES&Tech Letters (2021)

### Fluorinated Compounds in North American Cosmetics

Heather D. Whitehead, Marta Venier, Yan Wu, Emi Eastman, Shannon Urbanik, Miriam L. Diamond, Anna Shalin, Heather Schwartz-Narbonne, Thomas A. Bruton, Arlene Blum, Zhanyun Wang, Megan Green, Meghanne Tighe, John T. Wilkinson, Sean McGuinness, and Graham F. Peaslee\*



Cite This: *Environ. Sci. Technol. Lett.* 2021, 8, 538–544



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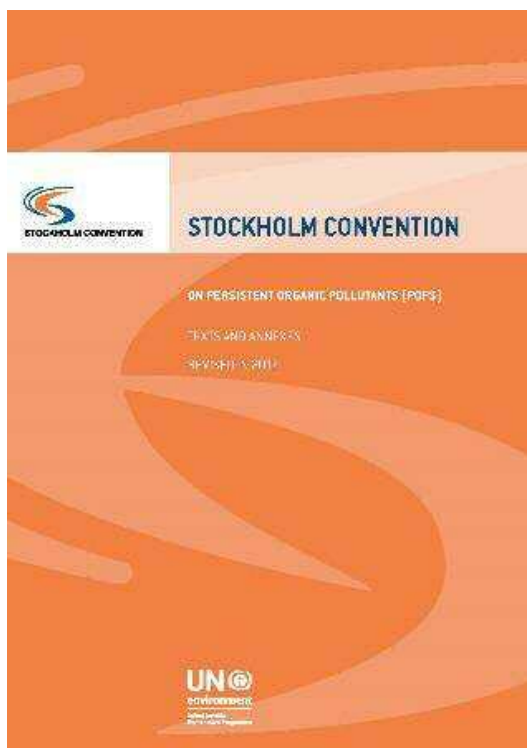
# WHAT'S UP WITH PFAS

## CANADIAN PERSPECTIVE



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### HIGH PROFILE, POLITICALLY CHARGED, 'CHEMICALS OF CONCERN'

- PFOA, PFOS and LC-PFCAs (including their salts and precursors) are all listed in the Prohibition of Certain Toxics Regulations (PCTR 2012) (proposed for revision, 2022)
- PFOA and PFOS are proposed to be added to the Persistent Organic Pollutant (POP) List (Stockholm Convention)
- CANADA submitted nomination to also identify LC-PFCAs as POPs (2021)

20	Perfluorocarboxylic acids that have the molecular formula $C_nF_{2n+1}CO_2H$ in which $8 \leq n \leq 20$ and their salts, and compounds that consist of a perfluorinated alkyl group that has the molecular formula $C_nF_{2n+1}$ in which $8 \leq n \leq 20$ and that is directly bonded to any chemical moiety other than a fluorine, chlorine or bromine atom
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Chemical Formula :  
LC-PFCAs

Excerpt from PCTR, 2021  
[<https://laws-lois.justice.gc.ca/eng/regulations/SOR-2012-285/FullText.html>]

# WHAT'S UP WITH PFAS [cont.]

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### CURRENT ENFORCEMENT BLITZ

- Significant New Activity Notices (SNACs); Stop Sale, Product Withdrawal/Destruction
  - Perfluorononyl Dimethicone (INCI Monograph ID 12795)
    - CASRN: 882878-48-0; SNAC 14673 (May 2007)
  - Perfluorooctyl Triethoxysilane (INCI Monograph ID 15300)
    - CASRN: 51851-37-7; SNAC 11489a (September 2013)
- Targeted action on \*\*\* **Possible degradation products** \*\*\* (random on-market samplings and analysis – despite degradation products being out of scope of current controls)
  - Perfluorobutanoic acid (PFBA) [CASRN: 375-22-4]
  - Perfluorohexanoic acid (PFHxA) [CASRN: 307-24-4]
  - etc.



# WHAT'S UP WITH PFAS [cont.]

## CANADIAN PERSPECTIVE



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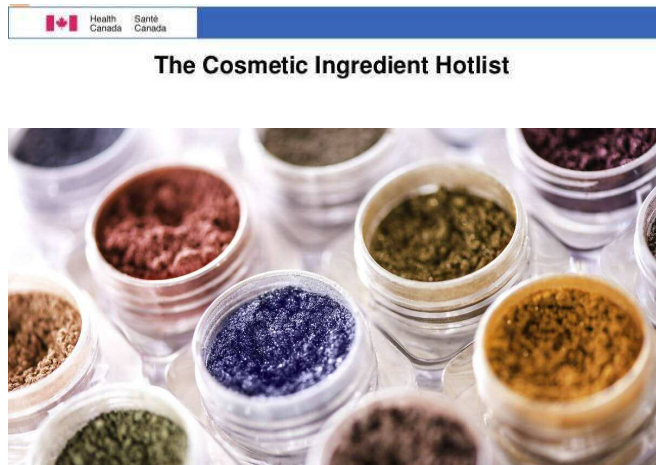
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### HEALTH CANADA RESTRICTIONS?

- Presently, no PFASs identified on Cosmetics Hotlist
- Some PFAS (including those used in cosmetics) identified in NHPID and DPD
- BUT...
  - Health Canada regulates finished products
  - Environment Climate Change Canada regulates substances, including uses in finished products (i.e., ingredients/raw materials)

### Needless to Say

**THE WRITING IS ON  
THE WALL**



# PREPARING FOR CHANGE

## COSMETIC INDUSTRY PERSPECTIVE



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### ENHANCED SLIP/FEEL and WATER/SWEAT PROOFING FUNCTIONAL BENEFITS

- PFOA/PFOS unlikely used in cosmetic/personal care products; LC-PFCAs and other PFASs may be used as intentionally added functional ingredients
- Human health safety profiles for some PFASs may be substantiated and supported;
- Environmental persistence challenges likely to largely apply across the class (carbon-fluorine bond)
- Cosmetic Sector Focus – Globally, reformulation in progress
  - Secure appropriate transition time to allow for or sound substitution and sensible/practical reformulation )



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# PREPARING FOR CHANGE [cont.]

## THE BIG QUESTION?



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### SCOPE AND TIMING

- Not all PFASs are PFOAs and PFOSs (need to understand how differentiation will materialize from a regulatory context – defining substitution targets and reformulation priorities)
- Timing is uncertain – but interest and political pressure is mounting
- Opportunity for proactive engagement and research
  - Innovative solutions in the pipeline
  - Active engagement with vendors
  - Are there ready solutions in the short term?
  - Reformulation prioritization in the medium- to long-term)
  - What do we do about degradation products (i.e., traces)?



# PREPARING FOR CHANGE [cont.]

## REGULATORY LANDSCAPE – ON THE HORIZON



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### IN ADDITION TO POPs NOMINATION

- PFAS State of Science Review [[Notice of Intent](#) published in 2021, Report to be published in spring 2023]
  - Should inform/focus data needs and next policy direction/steps
- PFAS Section 71 Information Gathering Survey [to be published in Q1 2023]
  - Will cover just over 100 priority PFAS substances (final draft list to be made available in advance of formal publication – stay tuned)
  - Intent of survey is to understand present volumes of use and available science/toxicological database

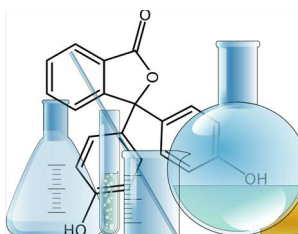


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# PREPARING FOR CHANGE [cont.]

## INTERNATIONAL ENGAGEMENT



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### COLLABORATIVE INTERNATIONAL DIALOGUE

#### ➤ International Association Collaboration (IAC)

- International dialogue (tracking PFAS developments, globally)
- Standardized definitions (to enable coordination and convergence on scope)
- Monitoring emerging dialogue related to Global Treaties (Stockholm – POPs)

#### ➤ Industry Engagement

- Moving towards consensus to move away from deliberate use of PFASs in cosmetic/personal care products
- Understand critical needs for cosmetics/personal care products and related personal care products of interest (e.g., grooming products)
- R&D efforts to identify viable substitution candidates to facilitate gradual and reasonable transition away from PFAS over time
- Investigate and address possible incidental presence of PFASs as impurities

ONE VISION



ONE VOICE

## YOUR THOUGHTS?

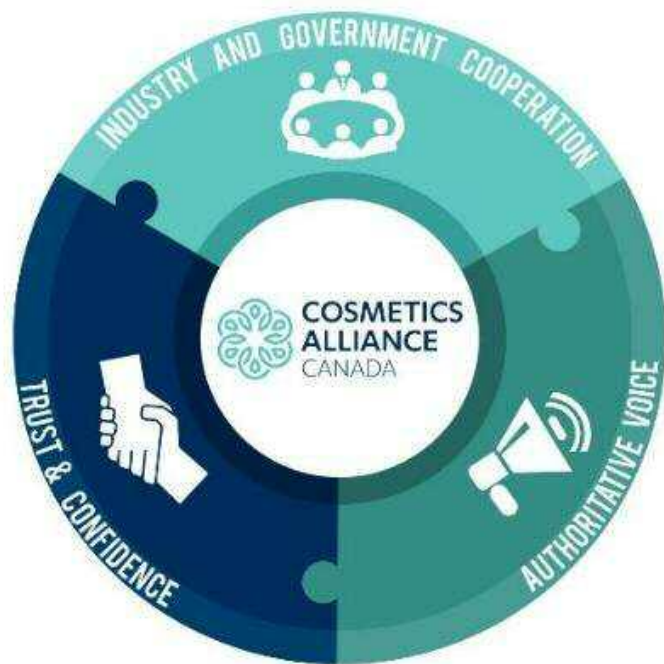


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# Thank You

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