



**CLEAN  
PRODUCTION  
ACTION**



# GreenScreen Certified™ Standard for Firefighting Foam

WEBINAR

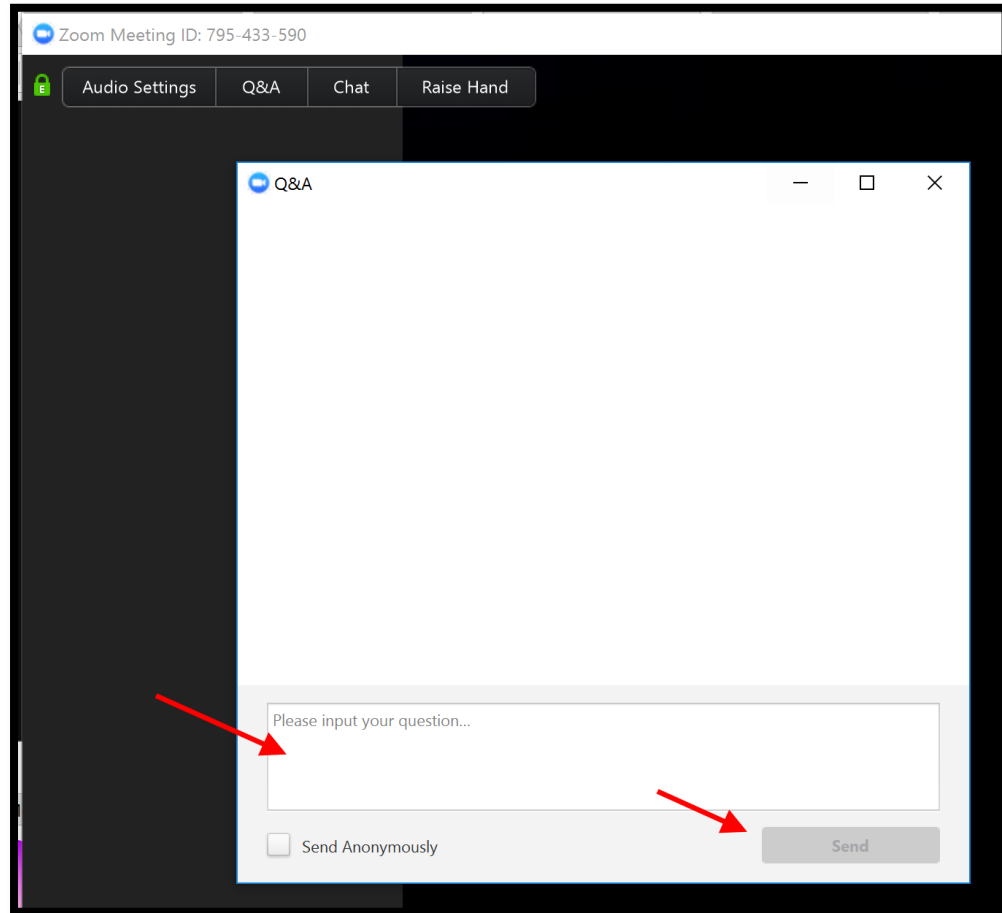
FEBRUARY 25, 2020



# Clean Production Action – solutions for a safer & healthier tomorrow



# Webinar Questions



Post your question to the Q&A section of your Zoom Control Panel

Presentation and recording will be available at [greenscreenchemicals.org](https://greenscreenchemicals.org)

# Speakers

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**Shari Franjevic**

*GreenScreen Program Manager*  
Clean Production Action



**Erika Schreder**

*Science Director*  
Toxic-Free Future



**David Plant**

*Global Product Manger*  
*for Firefighting Chemicals*  
National Foam



**Randy Krause**

*Fire Chief*  
Port of Seattle  
Fire Department

# Outline

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Firefighting Foam: Finding Safer Solutions

GreenScreen Certified™

Value to Manufacturers

Value to Users

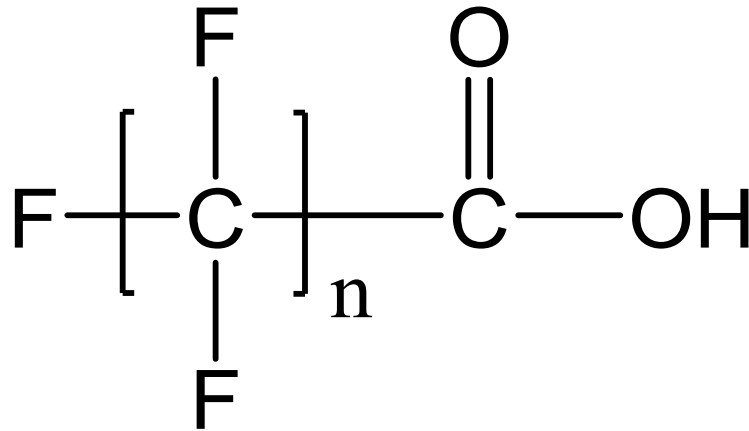
Q&A

# Firefighting Foam: Finding Safer Solutions



Erika Schreder  
Science Director  
Toxic-Free Future

# PFAS: Per- and Polyfluoroalkyl Substances



Carbon-fluorine bond is strongest in organic chemistry





# Why are PFAS Such a Big Deal?

- All PFAS ingredients in products break down eventually to chemicals that never degrade
- PFAS can harm health at low exposure levels, and some build up in our bodies



# PFAS Health Concerns

- Pregnancy-induced hypertension
- Liver damage
- Increased cholesterol
- Thyroid disease
- Immune system harm



# Drinking Water Contamination

Estimated 6 million U.S. residents drinking water with PFAS above EPA health advisory level



# From Products to People

- PFAS escape products used indoors, contaminate air, get into people
- Diet, water also important exposure routes



# Firefighters Highly Exposed



- Training and Use of AFFF
- Testing of Equipment
- Gear

# Cancer is Leading Cause of Death of Firefighters

Large studies have found higher incidence of a number of cancers (stomach, brain, testicular, respiratory)



# Regulations

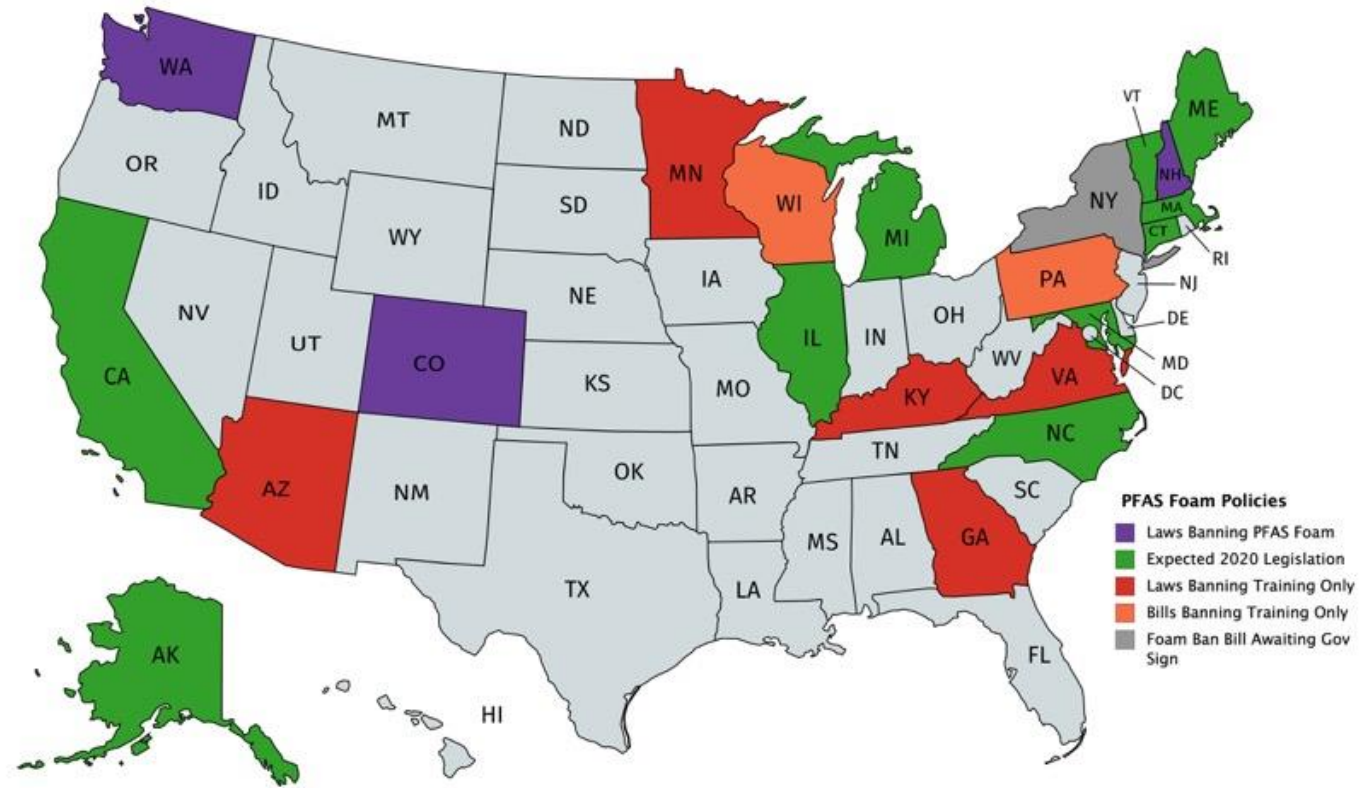
- EU: EU-POP Regulation released 2010 bans production and supply of PFOS above 0.001% (10 ppm); proposal restricting PFOA to 25 ppb or 1000 ppb related substance after July 2020
- US Navy: 2017 amended MILSPEC with 800 ppb limit on PFOS, PFOA
- Queensland, Australia: 2016 policy bans use of all PFAS in firefighting foam unless user shows C6 only viable option

# Washington State: First-In-Nation Restrictions

- 2008 law: prohibits PFAS-containing firefighting foams for training purposes
- Prohibits the sale of PFAS-containing firefighting foams for use in Washington after July 1, 2020—exemptions for use required by federal law, oil facilities, and chemical plants
- Manufacturers must recall product and reimburse purchasers
- Sellers of firefighting gear with PFAS must notify buyers



# State Action on PFAS Foams





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# GreenScreen Certified™

SHARI FRANJEVIC

*GREENSCREEN PROGRAM MANAGER,*

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2007

GreenScreen for Safer Chemicals —  
assess, and identify CoHCs and safer chemicals

2012

GreenScreen List Translator—  
quickly identify known chemicals of high concern  
(CoHCs)

2017

GreenScreen Certified—  
certified products, e.g. firefighting foam, textile  
formulations

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

# GreenScreen is Globally Recognized and Used

**LEVI STRAUSS & CO.**



DEPARTMENT OF  
**ECOLOGY**  
State of Washington

**Ø ZDHC**  
Zero Discharge of  
Hazardous Chemicals



# Apple uses GreenScreen to identify green alternatives



“We screen our materials with comprehensive risk assessment tools, including GreenScreen®, which evaluates substances against 18 different hazards, including carcinogens, mutagens, and endocrine disruptors.”



“Replaced all GreenScreen® Benchmark 1 and 2 cleaners with green alternatives in all final assembly facilities.”



*Simplify the complexity of toxicity for purchasers & provide manufacturers with incentives for disclosing chemicals in products, assessing hazards of those chemicals, and using safer chemicals*

# GreenScreen Certified™ for Textile Chemicals

Launched in 2017

112 products certified!



GreenScreen Certified™ Products

Filter By:

Company: Any    Standard: Textile finishing    Level: Any

Product	Company	Standard	Version	Level
Yellow GS	Garmon Kemin Textiles	Textile finishing	v1.0	Bronze
Yellow B-GS	Garmon Kemin Textiles	Textile finishing	v1.0	Bronze
VesZym Cell Max CM	Veskim Kimyevi Madde Ithalat Ihracat A.S.	Textile finishing	v1.0	Bronze
VesPers Jean 977 New	Veskim Kimyevi Madde Ithalat Ihracat A.S.	Textile finishing	v1.0	Bronze
VesPers Jean 1017	Veskim Kimyevi Madde Ithalat Ihracat A.S.	Textile finishing	v1.0	Bronze
TLP NEUTRA-GREEN	TLP International	Textile finishing	v1.0	Bronze
TLP ENZYCLEAR	TLP International	Textile finishing	v1.0	Bronze

# GreenScreen Certified™ for Firefighting Foam

1. All chemicals disclosed under confidentiality
2. All chemicals assessed for hazard using GreenScreen tools
3. Product meets Restricted Substances List requirements
4. Product meets analytical testing requirements





# Chemicals Disclosed under Confidentiality

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All chemicals disclosed under confidentiality:

- Intentionally added > 0 ppm
- Impurities > 100 ppm

# Products Assessed using GreenScreen Tools

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## GreenScreen List Translator:

- Based on 42 lists from authoritative scientific bodies e.g.,
  - EU REACH Substances of Very High Concern
  - United Nations – Stockholm Persistent Organic Pollutants
  - World Health Organization’s International Agency for the Research on Cancer (IARC)
- Automated and freely available

## GreenScreen Hazard Assessment:

- Comprehensive review of 18 human and environmental health endpoints and all available data
- Conducted by Licensed toxicology firms

# Chemicals of High Concern

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- **CMRs =**
  - Carcinogens,
  - Mutagens, or
  - Reproductive / Developmental Toxicants
- **PBTs =**
  - Persistent, and
  - Bioaccumulative, and
  - Toxic
- **Equivalent Concern =**
  - Endocrine Disruptors

# Restricted Substances List

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1. Zero Discharge of Hazardous Chemicals MRSL
2. Alkylphenols and alkylphenol ethoxylates
3. Siloxanes: Cyclic volatile methyl siloxanes
4. PFAS: Per- and polyfluoroalkyl substances
5. Organohalogens

# Product Analytical Testing Requirements

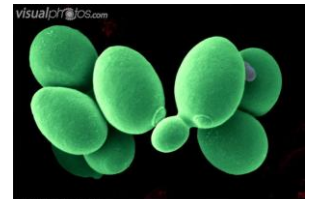
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1. Acute aquatic toxicity
2. Total organic fluorine

# Acute Aquatic Toxicity Testing

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- Measured on product as sold
- Results required for fish, aquatic invertebrates, and algae
- LC50 or EC50 > 10 mg/L for all three types of organisms



# Total Organic Fluorine Testing

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- Measured on the product as sold (i.e., concentrate)
- Samples: Test samples from three different lots or batches
- **Requirement: < 1 mg/kg (< 1 ppm) total organic fluorine**
- Laboratory: international commercial laboratory
- Method: Combustion ion chromatography

# GreenScreen Certified™ Product Registry

## Firefighting Foam:

- Launched in January 2020
- Four products certified

The screenshot shows the GreenScreen Certified website interface. At the top, there's a navigation bar with 'Learn +', 'Assess +', 'Certified', and 'News & Resources'. Below that, the 'GreenScreen Certified™' logo is displayed. The main content area is titled 'GreenScreen Certified™ Products'. It features three dropdown menus for 'Company' (set to 'Any'), 'Standard' (set to 'Firefighting Foam'), and 'Level' (set to 'Any'). Below the filters is a table with the following data:

Product	Company	Standard	Version	Level
Universal F3 Green 3X3: Class B Foam Concentrate	National Foam, Inc.	Firefighting Foam	v1.0	Bronze
Respondol ATF 3/3: Class B Foam Concentrate	Angus Fire Ltd	Firefighting Foam	v1.0	Bronze
Micro-Blaze Out: Class A&B Wetting Agent	Verde Environmental, Inc	Firefighting Foam	v1.0	Bronze
ECOPOL: Class B Foam Concentrate	BIOEX	Firefighting Foam	v1.0	Bronze



# Firefighting Foam: GreenScreen Certified

Clean Production Action, Webinar – February 25, 2020

Presenter: David Plant

**Global Product Manager – Firefighting Chemicals**

# Our industry's challenges

- **No standard product name or definition to work with**

- Where 'AFFF' is a globally recognised term, 'F3' is not
  - NFPA 11 (TBC): SFFF/SF3 Synthetic Fluorine Free Foam
  - NFPA 403: FFSF Fluorine Free Synthetic Foam
  - EN 1568: F3 Fluorine Free Foam
  - UL 162: S Synthetic

- **Uncertain regulatory outlook**

- Federal, State and local regulations can differ for fluorinated products
- No agreed or validated method to substantiate 'no intentionally added PFAS'

- **If users want to convert, how do they do so?**

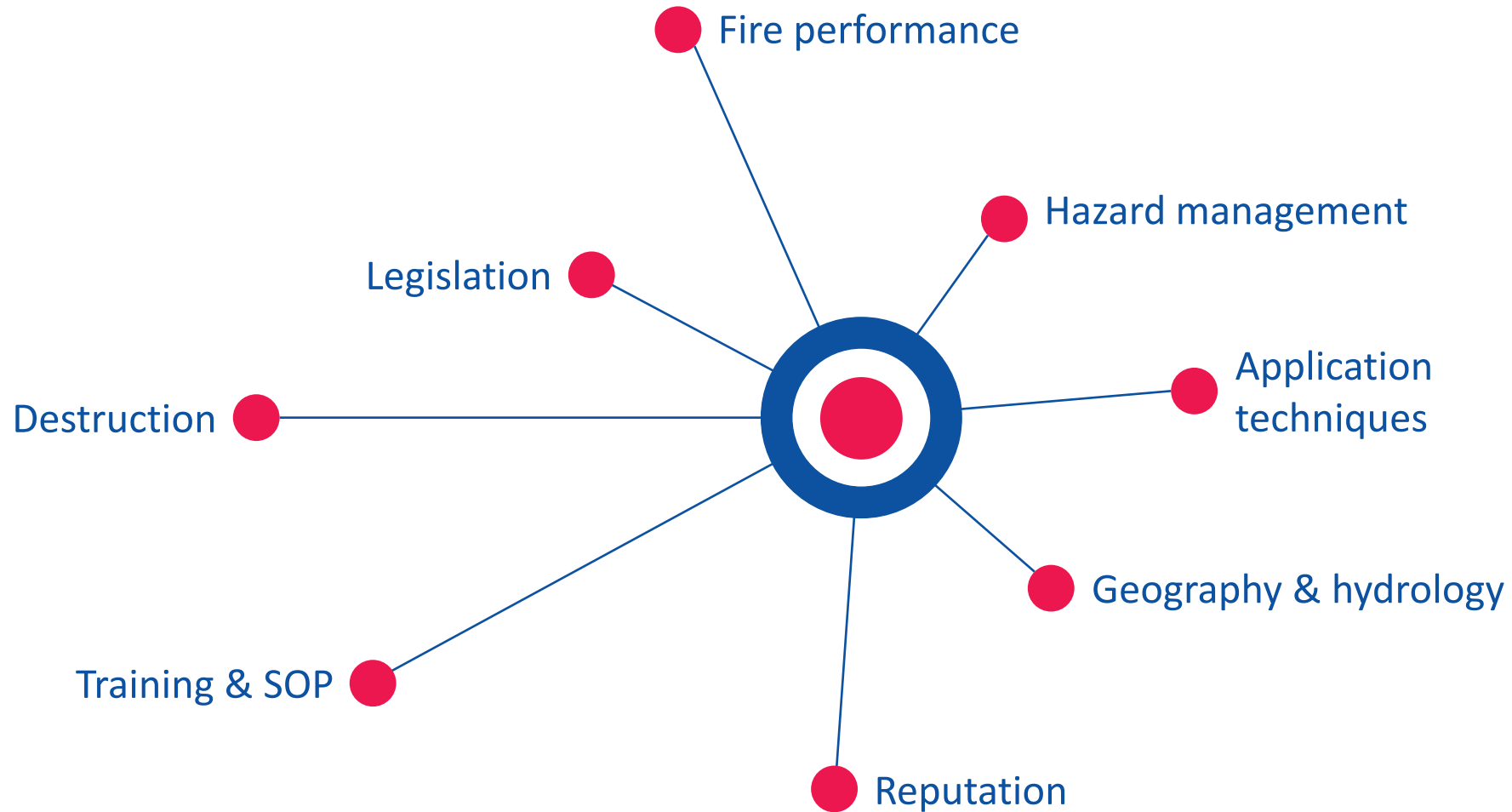
- Do users focus on the 'bulk' or 'ppt traces' and over what time-period?
- Full 'system refit' or 3x flush or 5x flush or replace 'core components' only
- 'Zero' or 'PFAS free' is not possible or practical; "How clean is clean?"



*Foam should be bought  
which meets  
site-specific needs*

*Manufacturers have products, end-users assess their risks,  
then buy the product which best meets their needs.*

# Some site-specific needs – nothing here is new



The future isn't what it  
used to be ...



Source: [backgroundpictures.org](http://backgroundpictures.org)

*Ready for action. Rely on our foams.*

© National Foam

*What is meant by*  
***viable alternative***

*Manufacturers must be part of the conversation, but end-users and regulators (performance and environmental) must work together to set the rules and targets*



Main questions from fire fighters:

*Does it Work?*

*Can I use it?*

Source: [icms.edu.au](http://icms.edu.au)

*Does it work?*

High performing F3 is available, listed and approved



Source: [personneltoday.com](http://personneltoday.com)





*Can I use it?*

**Foam cannot always be contained, but its use is essential**

# Firefighting foam

## ■ Does it work?

- High performing F3 products are available for a range of applications
  - *Municipal:* **Universal<sup>F3</sup> Green** UL162, Type III – 15% ethanol/gasoline blend
  - *Industrial:* **Universal<sup>F3</sup> Green** UL162, Lastfire, 33' tank, 131' foam flow, etc
  - *Aviation:* **Avio<sup>F3</sup> Green** NFPA 403, ICAO-C, (film-forming on Jet-A/A1)
  - *Military:* **SERDP** (DoD, EPA, DoE) working with National Foam on F3 mil-spec



## ■ Can I use it?

- GreenScreen Certified is independent validation of 'no intentionally added PFAS'
- Independent assessment of complete formulation; ingredients and impurities
- Valuable for formulators & end-users for understanding impacts of products



## ■ Important to remember

- Firefighting foam choice needs to meet site-specific or system-specific needs
- Foam use is essential to reduce risk to life, the environment and critical assets
- The answer to "How clean is clean?" must be pragmatic if it is to be achieved



# Thank you

Clean Production Action, Webinar – February 25, 2020

[david.plant@aisafetygroup.com](mailto:david.plant@aisafetygroup.com)

**Global Product Manager – Firefighting Chemicals**

# Value of Certification to Users

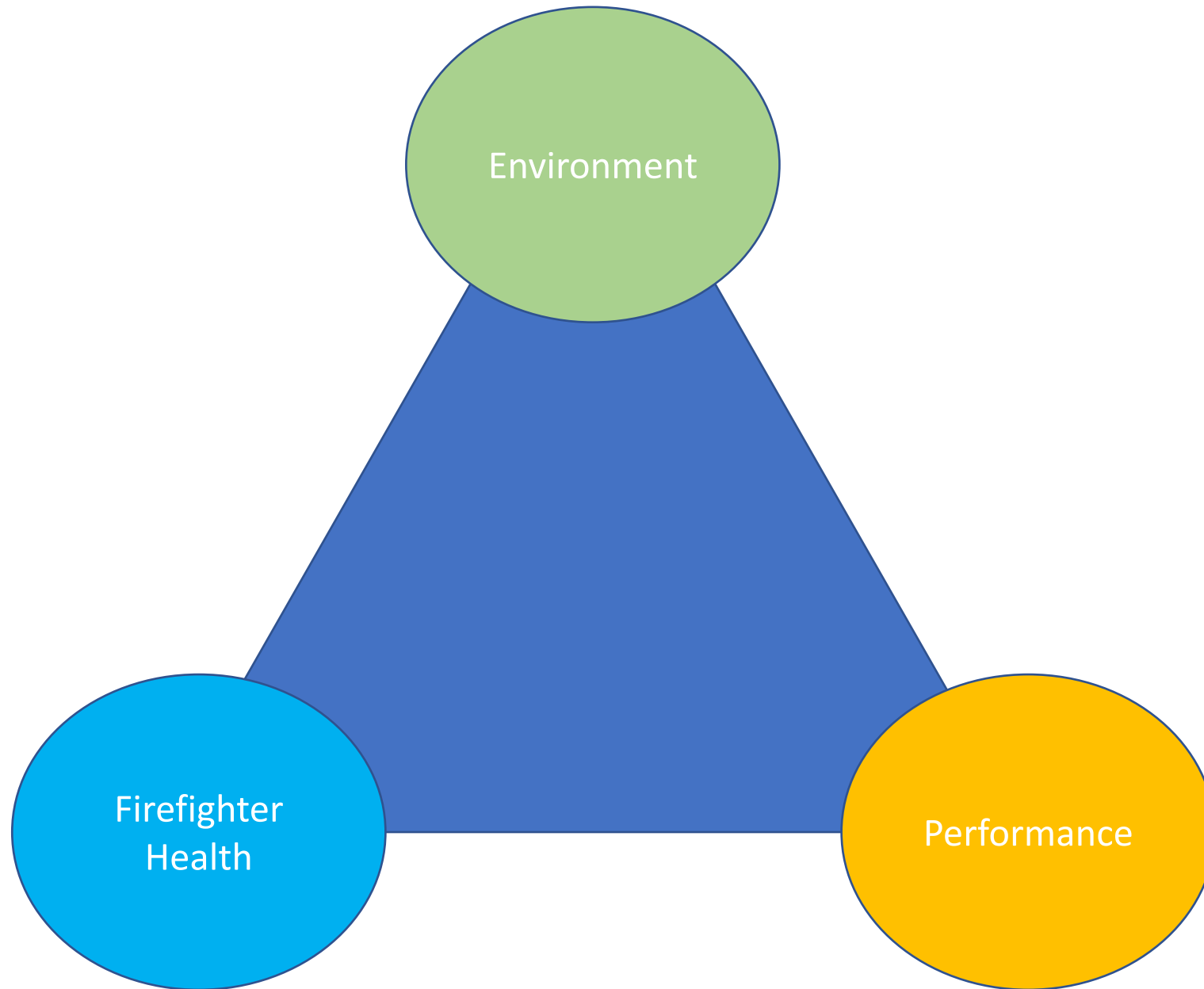


Randy Krause

Fire Chief

Port of Seattle Fire Department





# Questions



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# Thank you!

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## Contact Clean Production Action:

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