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## **Acronyms**

AACO Army Aviation Centre Oakey
AA-QS annual average quality standards

**ADONA** trade name for 4,8-dioxa-3H-perfluorononanoate

**AERMOD** American Meteorological Society/EPA Regulatory Model

AFCEC Air Force Civil Engineering Center

AFFF aqueous film-forming foam alanine aminotransferase

amu atomic mass unit

ANSES French National Agency for Food Safety, Environment and Labor

ANSI American National Standards Institute

**AOF** adsorbable organic fluorine

**APC** air pollution control

APFN ammonium perfluoronanoate
APFO ammonium perfluorooctanoate

**ARAR** applicable or relevant and appropriate requirement

AM arithmetic mean

**ANPRM** Advance Notice of Proposed Rulemaking

**ARP** advanced reduction processes

ATSDR Agency for Toxic Substances and Disease Registry

AWI Air-water interface

**AWQC** ambient water quality criteria

**BAF** bioaccumulation factor

**BARC** bottom antireflective coatings

**BAT** best available technology economically achievable

BBMD Bayesian benchmark dose bioconcentration factor

**BERA** baseline ecological risk assessment

**bgs** below ground surface **BMD** benchmark dose

BMF biomagnification factor
BMP best management practices

**BOHP**  $Bi_3O(OH)(PO_4)_2$ 

BSAF biota-sediment accumulation factor
BuFASA N-butyl perfluoroalkane sulfonamide

**Bufase**N-butyl perfluoroalkane sulfonamido ethanols

N-butyl perfluoroalkane sulfonamido acetic acid

BW bed volume body weight C carbon

C&D historical name for PFOA construction and demolition

CAA Clean Air Act

**CAC** colloidal activated carbon

CalEPA California Environmental Protection Agency
CAP chemical action plan, or corrective action plan

**CAPEX** capital expenses

**CAS** Chemical Abstracts Service

**CBPR** community-based participatory research

CCL Contaminant Candidate List continuing calibration verification

**CDC** U.S. Centers for Disease Control and Prevention

CERCLA Comprehensive Environmental Response, Compensation, and Liability Act

CFR Code of Federal Regulations
CHP catalyzed hydrogen peroxide
CIC combustion ion chromatography

**CIMS** chemical ionization mass spectrometry

**CL** clearance factor

**CIPFPECA** chloroperfluoropolyether carboxylate

**CMC** critical micelle concentrations

**CNT** carbon nanotube

**COOH** carboxylic acid functional group

CSF cancer slope factor
CSM conceptual site model
CWA Clean Water Act
Dalton (unit of mass)

**DDT** dichlorodiphenyltrichloroethane

**DIN EN** Deutsches Institut für Normung, German Institute for Standardization, English

**DMSO** dimethyl sulfoxide

**DNAPL** dense nonaqueous phase liquid

**DOC** dissolved organic carbon **DQO** data quality objective

**DW** drinking water

**DWR** durable water repellent

**EAO** emergency administrative order

**EBCT** empty bed contact time

**ECCC** Environment and Climate Change Canada

**ECHA** electrochemical fluorination **ECHA** European Chemicals Agency

**ECOS** Environmental Council of the States

**ECT** Emerging Compound Treatment Technologies, Inc.

**EE/CA** Engineering Evaluation/Cost Analysis

EIS extraction internal standards
ELG effluent limitation guidelines
EPC exposure point concentration
ERA ecological risk assessment
ERB equipment rinse blank

**ESS** Environmental Sequence Stratigraphy

**ESTCP** Environmental Security Technology Certification Program

**EtFASA** *N*-ethyl perfluoroalkane sulfonamide

**EtFASE** N-ethyl perfluoroalkane sulfonamido ethanol (var: N-ethyl perfluoroalkane sulfonamide

ethanol)

**EtFASAA** N-ethyl perfluoroalkane sulfonamido acetic acid (var: N-ethyl perfluoroalkane sulfonamide

acetic acid)

**ETFE** ethylene tetrafluoroethylene

**EtFOSA** *N*-ethyl perfluorooctane sulfonamide

**EtFOSE** N-ethyl perfluorooctane sulfonamido ethanol (var: N-ethyl perfluorooctane sulfonamide

ethanol)

**EU** European Union

**F** fluorine

F-53B chlorinated polyfluorinated ether sulfonate (PFOS substitute for plating)

**F3** fluorine-free foams

FAA Federal Aviation Administration FAQ frequently asked questions FASA perfluoroalkane sulfonamide

**FASE** perfluoroalkane sulfonamido ethanol (var: perfluoroalkane sulfonamide ethanol)

FASAA perfluoroalkane sulfonamido acetic acid (var: perfluoroalkane sulfonamide acetic acid)

FCS food contact materials

FCS food contact substances

**FD** field duplicate

**FDA** U.S. Food and Drug Administration

FEC Foam Exposure Committee

FECA fluorinated ether carboxylate

FEP perfluorinated ethylene-propylene

FFFC Fire Fighting Foam Coalition

FFFP film-forming fluoroprotein foam

FhxSA perfluorohexane sulfonamide

foc fraction of organic carbon

FOSA, or PFOSA perfluorooctane sulfonamide

**FOSE** perfluorooctane sulfonamido ethanol (var: perfluorooctane sulfonamide ethanol)

FOSAA perfluorooctane sulfonamido acetic acid (var: perfluorooctane sulfonamide acetic acid)

**FP** fluoroprotein (used in the contex of firefighting foam formulations that contain a

fluorinated surfactant)

**FRB** field reagent blank

**FRM** Federal Reference Method

**FSANZ** Food Standards Australia and New Zealand

**FTA** free thyroxine fire training area

FTCA fluorotelomer carboxylic acid

**FT-ICR** Fourier transform ion cyclotron resonance

FTOH fluorotelomer alcohol

FTSA or FTS fluorotelomer sulfonate, fluorotelomer sulfonic acid

**FTUCA** fluorotelomer thioether amido sulfonate fluorotelomer unsaturated carboxylic acid

FWQC federal water quality goal
GAC granular activated carbon
GC gas chromatography

**GC/MS** Gas chromatography/mass spectrometry

**GEF** Global Environment Facility

**GenX** trade name for a polymerization processing aid formulation that contains ammonium

2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)propanoate

GLI Great Lakes Initiative
GM geometric mean

**GMAV** genus mean acute value

**HA** health advisory

HASP Health and Safety PlanHDPE high-density polyethylene

**HFPO-DA** hexafluoropropylene oxide dimer acid

**HHRA** human health risk assessment

HI hazard index HQ hazard quotient

HRMS high-resolution mass spectrometryHRSC High-resolution site characterization

IARC International Agency for Research on Cancer
ICAO International Civil Aviation Organization

ICV initial calibration verification
IDA isotope dilution analysis
IDW investigation-derived waste

IPEN International Pollutants Elimination Network

IRIS Integrated Risk Information System

ITRC Interstate Technology and Regulatory Council

**IX** ion exchange

**K**<sub>d</sub> bulk partitioning coefficient

**K**<sub>oc</sub> organic carbon partitioning coefficent

K<sub>ow</sub> water/octanol coefficientLC liquid chromatography

LC/MS/MS liquid chromatography/mass spectrometry/mass spectrometry

**LCS** lab control sample

**LCPFAC** long-chain perfluoroalkyl carboxylate

**LDPE** low-density polyethylene

**LEAF** Leaching Environmental Assessment Framework

**LHA** lifetime health advisory

LHWA Little Hocking Water Association
LNAPL light nonaqueous phase liquid

LOAEL lowest observed adverse effect level lowest observed effect concentration

**LOQ** limit of quantitation

MA DEP Massachusetts Department of Environmental Protection

MAC-QS maximum acceptable quality standards

MALDI-TOF matrix-assisted laser desorption/ionization time-of-flight

MCL Maximum Contaminant Level

MDH Minnesota Department of Health

MeFASA N-methyl perfluoroalkane sulfonamide

MeFASE N-methyl perfluoroalkane sulfonamido ethanol (var: N-methyl perfluoroalkane sulfonamide

ethanol)

MeFASAA N-methyl perfluoroalkane sulfonamido acetic acid (var: N-methyl perfluoroalkane

sulfonamide acetic acid)

MeFOSA N-methyl perfluorooctane sulfonamide

MEP Multiple Extraction Procedure

ML method limit

MNA monitored natural attenuation

MOA mode of action

MPCA Minnesota Pollution Control Agency

MRL minimal risk level, or minimum reporting limit (laboratory analytical)

MRM multiple reaction monitoring

MS mass spectrometry
MSD matrix spike duplicate
MSW municipal solid waste
MWCO molecular weight cut-off
NAM new assessment method
NaPFO sodium perfluorooctanoate
NAPL nonaqueous phase liquid

NCOD National Contaminant Occurrence Database

**NER** non-extractable residues

**NESHAP** National Emissions Standards for Hazardous Air Pollutants

**N-EtFOSA** N-ethyl perfluorooctane sulfonamide

**NF** nanofiltration

NFPA National Fire Protection Association
NGWA National Groundwater Association

NHANES
National Health and Nutrition Examination Survey
NHDES
New Hampshire Department of Environmental Services
NJ DEP
New Jersey Department of Environmental Protection

**NJDWQI** New Jersey Drinking Water Quality Institute

NMeFOSAA N-Methylperfluorooctane sulfonamidoacetic acid

NOAEL no observed adverse effect level NOEC no observed effect concentration

**NOM** natural organic matter

NOx nitrogen oxides

NPCA Norwegian Pollution Control Agency

NPDES National Pollutant Discharge Elimination System
NPDWRs National Primary Drinking Water Regulations

**NPL** National Priorities List

NSF National Sanitation Foundation
NTP National Toxicology Program
NWQC national water quality criteria

**NYDEC** New York State Department of Environmental Conservation

O&M operation and maintenance
OAT organic anion transporter protein

**OC** organic carbon

**OCPSF** organic chemicals, plastics and synthetic fibers

OECD Organisation for Economic Co-operation and Development
OEHHA Office of Environmental Health Hazard Assessment (California)

**OH** hydroxide ion, or hydroxyl group (<u>Helmenstine 2018</u>)

**OPEX** operating expenses

**ORD** Office of Research and Development (USEPA)

**OSB** oriented strand board

**OU** operable unit

**PAB** permeable absorptive barrier

PA DEP Pennsylvania Department of Environmental Protection

PAC powdered activated carbon
PAF perfluoroalkanoyl fluorides

PAH polycyclic aromatic hydrocarbon
PASF perfluoroalkane sulfonyl fluoride
PBSF perfluorobutane sulfonyl fluoride
PBT persistent, bioaccumulative, and toxic

PCA principal components analysis
PCBs polychlorinated biphenyls

PCE perchloroethylene
PE performance evaluation
PFA perfluoroalkoxy polymer
PFAA perfluoroalkyl acid
PFAI perfluoroalkyl iodides

**PFAS** per- and polyfluoroalkyl substances

**PFBA** perfluorobutanoate, perfluorobutanoic acid, perfluorobutyrate, perfluorobutyric acid

**PFBE** perfluorobutyl ethylene

**PFBS** perfluorobutane sulfonate, perfluorobutane sulfonic acid **PFC** perfluorocarbon ( $C_nF_{2n+1}$ , for example, perfluorocatane)

Do not use this acronym for any other description including perfluorinated compound or

perfluorochemical.

**PFCA** perfluoroalkyl carboxylate, perfluoroalkyl carboxylic acid

**PFDA** perfluorodecanoate, perfluorodecanoic acid **PFDoA, or PFDoDA** perfluorododecanoate, perfluorododecanoic acid

**PFDoS**, **or PFDoDS** perfluorododecane sulfonate, perfluorododecane sulfonic acid **PFDS** perfluorodecane sulfonate, perfluorodecane sulfonic acid

PFECA per- or polyfluoroalkyl ether carboxylic acid
PFEI perfluoroethyl iodide (aka fluorotelomer iodide)
PFESA per- or poly- fluoroalkyl ether sulfonic acid
PFHpA perfluoroheptanoate, perfluoroheptanoic acid

**PFHpS** perfluoroheptane sulfonate, perfluoroheptane sulfonic acid

**PFHxA** perfluorohexanoate, perfluorohexanoic acid

**PFHxS** perfluorohexane sulfonate, perfluorohexane sulfonic acid

**PFIB** perfluoroisobutylene

**PFMOAA** perfluoro-2-methoxyacetic acid

**PFNA** perfluorononanoate, perfluorononanoic acid

**PFNS** perfluorononane sulfonate, perfluorononane sulfonic acid

**PFOA** perfluorooctanoate, perfluorooctanoic acid, perfluorooctane carboxylate

**PFOS** perfluorooctane sulfonate, perfluorooctane sulfonic acid

PFPA perfluorophosphonic acid
PFPE perfluoropolyether

**PFPeA** perfluoropentanoate, perfluoropentanoic acid

**PFPeS** perfluoropentane sulfonate, perfluoropentane sulfonic acid

**PFPiA** perfluorophosphinic acid

**PFSA** perfluoroalkyl sulfonate, perfluoroalkane sulfonic acid

PFSiA perfluoroalkyl sulfinic acid
PFTeDA, or PFTA perfluorotetradecanoic acid

PFTeDS, or PFTS perfluorotetradecane sulfonate, perfluorotetradecane sulfonic acid

PFTrDA, or PFTriA perfluorotridecanoic acid

PFTrDS, or PFTriS perfluorotridecane sulfonate, perfluorotridecane sulfonic acid

PFUnA, or PFUnDA perfluoroundecanoate, perfluoroundecanoic acid

PFUnS, or PFUnDS perfluoroundecane sulfonate, perfluoroundecane sulfonic acid

**pg/m³** picogram per cubic meter

**pH** negative log of hydrogen ion concentration (measure of acidity)

PHxSF perfluorohexane sulfonyl fluoride
PICs products of incomplete combustion

**PIGE** partice-induced gamma-ray emission spectroscopy

PIH pregnancy-induced hypertension
PILI polymer with ionic liquid coated iron
PNEC predicted no-effect concentration
POD porewater observation device

**POE** point of exposure

**POET** point of entry treatment

polyDADMAC Polydiallyldimethylammonium chloride

**POP** persistent organic pollutant

**POPRC-14** 14th meeting of the POPs Review Committee

**POSF** perfluorooctane sulfonyl fluoride

**POU** point of use

**PPAR-α** peroxisome proliferator-activated receptor- $\alpha$ 

ppb parts per billion

**PPE** personal protective equipment

ppm parts per million
ppt parts per trillion

**PPRTV** Provisional Peer-Reviewed Toxicity Values

PSA prostate-specific antigen
PSD passive sampling device
PTFE polytetrafluoroethylene
PUF polyurethane foam
PVDF polyvinylidene fluoride
PWS public water system
QA quality assurance

**QAPP** quality assurance project plan

QC quality control QL quantitation limit

QPD qualified products database
QPL Qualified Product Listing

**QSAR** quantitative structure-activity relationship

**QSM** Quality Systems Manual

**qTOF/MS** quadrupole time of flight-mass spectrometry

**RAO** remedial action objective

**RCRA** Resource Conservation and Recovery Act

**REACH** European Chemicals Regulation

**RfD** reference dose

RI/FS Remedial Investigation/Feasibility Study

**RIVM** Netherlands National Institue for Public Health and the Environment

**RL** reporting limit

**RML** removal management level

**RO** reverse osmosis

RPD relative percent difference
RPF relative potency factor
RSC relative source contribution

**RSL** regional screening level (Note: In many commercial venues RSL means "restricted

substances list.")

RSSCT rapid small-scale column testing
SAP Sampling and Analysis Plan
SCWO supercritical water oxidation

s.d. or SD standard deviationSDS Safety Data SheetSDWA Safe Drinking Water Act

**SERDP** Strategic Environmental Research and Development Program

**SIP** sorbent-impregnated polyurethane foam

**SL** screening level

**SMART** specific, measurable, attainable, relevant, and timely (goal)

**SMAV** species mean acute value

SMLsurface micro layerSMZsurface-modified zeolitesSNURSignificant New Use RuleSPEsolid-phase extraction

**SPLP** Synthetic Precipitation Leaching Procedure

SSD species sensitivity distributionSTAR Spill Tactics for Alaska Responders

**TANA** Technical Assistance Needs Assessments

**TARC** top-layer antireflective coatings

**TBC** to-be-considered values

**TBEL** technology-based effluent limits

**TCE** trichloroethene

TCEQ Texas Commission for Environmental Quality
TCLP Toxicity Characteristic Leaching Procedure

TDS total dissolved solids
TEQ toxic equivalency quotient

**TFE** tetrafluoroethylene

TMDL total maximum daily loads
 TMF trophic magnification factor
 TO Toxic Organic (method)
 TOC total organic carbon

**TOF** time-of-flight

TOP total oxidizable precursor
TRRP Texas Risk Reduction Program

**TRV** toxicity reference value

TSH Thyroid-stimulating hormones
TSCA Toxic Substances Control Act
target organ toxicity doses

**UCMR** Unregulated Contaminant Monitoring Rule

**UF** ultrafiltration

mg/kgmicrograms per kilogramULUnderwriters Laboratories

**U.S.C.** United States Code

USDOD United States Department of Defense
USDW Underground sources of drinking water

**USEPA** United States Environmental Protection Agency

**USGS** United States Geological Survey

**VDEC** Vermont Department of Environmental Conservation

**VDH** Vermont Department of Health **VOC** volatile organic compound

**WQBEL** water quality-based effluent limits

**WV** wildlife value **ww** wet weight

**WWTP** wastewater treatment plant

**ZVI** zero-valent iron

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