“Forever Chemicals”

Industries, Regulations, Risks and Insurance Challenges for PFAS Chemicals

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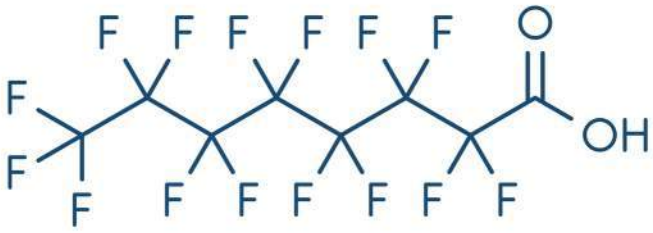
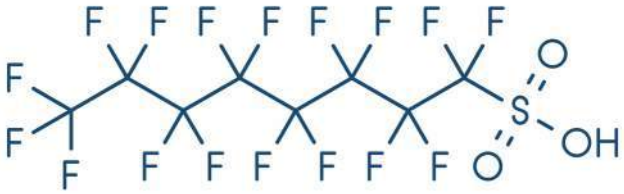
Written by Environmental Risk Professionals

Per- and polyfluoroalkyl substances (PFAS) are a group of synthetic compounds made up of long carbon chains with bound fluorine atoms. These bonds are very strong, resulting in chemicals that are difficult to break down and that are persistent in the environment, bioaccumulating in humans, plants, and animals. These chemicals have been labeled as "forever chemicals" because of these characteristics. They have been manufactured and widely used over the last 80 years in the U.S. to make products resistant to heat, oil, stains, grease, and water. They're also used for fire-fighting foam and used to reduce friction in a number of products. Perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) have been the most extensively produced and studied of the PFAS chemicals. However, more than 4,700 PFAS chemicals exist.[i]



perfluorooctanoic acid



perfluorooctanesulfonic acid

Industries

Because of the unique physical and chemical properties of PFAS chemicals, they have been used in the following applications:

Architectural Resins

Resins used for a variety of applications for building adhesives, coatings, or as construction materials when a strong bond is required.

Chemical Fume Suppressants

Fume suppressants are used to reduce the hexavalent chromium emissions at the surface of electroplating or anodizing baths. Perfluorooctane sulfonic acid (PFOS) was historically used in these baths.

Class B Firefighting Foams

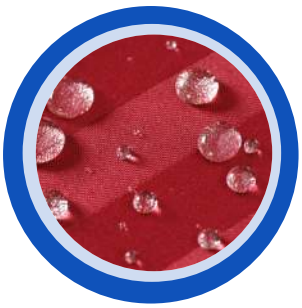
Aqueous Film Forming Foam (AFFF) are foams that contain varying amounts and mixtures of PFAS. Studies across the United States where AFFF has been used have confirmed the presence of PFAS contamination in soil and groundwater.

Non-Stick Coatings

Teflon is a brand name used for a group of man-made chemicals, the most common of which is polytetrafluoroethylene (PTFE). Teflon, which was discovered in 1938, is the most notable non-stick coating and has been used most notably in the coating of heat resistant non-stick cookware but also in many other products.

Protective Coatings

A variety of PFAS chemicals are used for coating plastics, metals, glass, and other materials to protect against mold and mildew, corrosion, staining, and weathering. The coatings are usually applied during the fabrication process. Examples include coatings for bathtubs, countertops, windows, mirrors, metal shingles and flashing.



Stain and Water-Resistant Products

Many different PFAS chemicals are used to enhance stain resistance, and water and soil repellency in products such as floor finishes, waxes and polishes, carpeting, furniture, paints, and sealers for grout, tile, stone, and concrete.

Waterproof Fabrics

Rain gear, umbrellas, camping gear and winter gear including coats and boots use PFAS for waterproofing.

According to UCPM, a wholesale insurance broker, a recent survey of pollution liability insurance carriers revealed that many will target certain industries by North American Industry Classification System (NAICS) code for further underwriting for PFAS. Figure 1 below identifies a compilation of NAICS codes for industries identified by various carriers, along with those identified by the Association of State Drinking Water Administrators:

Figure 1

NAICS codes for industries that may have used PFAS

NAICS Code	Industry Title	NAICS Code	Industry Title
3131, 313110	Fiber, yarn, and thread mills	3322 332215	Cutlery and handtool manufacturing; Nonstick metal cooking utensils
3132, 313210, 313220	Fabric mills; Broadwoven fabric mills; Narrow fabric mills and Schiffli machine embroidery	3328, 33281, 332812, 332813	Coating, engraving, heat treating & allied activities; Coating of metal and metal products with plastics for the trade; Electroplating, plating, polishing, anodizing, and coloring
3133, 313320	Textile and fabric finishing and fabric coating mills; Waterproofing apparel, fabrics and textile products (e.g., oiling, rubberizing, waxing, varnishing); Plastics coating of textiles and apparel	333241. 333242	Bakery ovens manufacturing, semiconductor making machinery manufacturing
3141	Textile furnishing mills	333318	Other commercial and service industry machinery manufacturing
3149, 314910	Other textile product mills; Textile bag and canvas mills	33351, 333517	Metalworking machinery manufacturing; Chemical milling machines, metalworking, manufacturing
3152, 315210, 315280	Cut and sew apparel manufacturing; Aprons, waterproof (including rubberized fabric, plastics), cut and sew, apparel contractors; Coats, waterproof (e.g., plastics, rubberized fabric, similar materials), rubberizing fabric and manufacturing coats; Bibs and aprons, waterproof (e.g., plastics, rubber, similar materials), rubberizing fabric and manufacturing bibs and aprons	334413, 334419	Semiconductor memory chips and related device manufacturing; Other electronic component manufacturing; Rectifiers, electronic component-type (except semiconductor), manufacturing
315990	Apparel accessories and other apparel manufacturing; Bibs and aprons, waterproof (e.g., plastics, rubber, similar materials), rubberizing fabric and manufacturing bibs and aprons	334515	Semiconductor test equipment manufacturing
3161, 316110	Leather and hide tanning and finishing; Upholstery leather manufacturing	3352, 335210, 335220	Household appliance manufacturing; Ovens, portable household-type (except microwave and convection ovens), manufacturing*; Microwave ovens (including portable), household-type, manufacturing*
3162, 316210	Footwear manufacturing; Footwear leather or vinyl upper with rubber or plastic soles, manufacturing	335999	Semiconductor high-voltage power supplies manufacturing
3169, 316998	All other leather good and allied product manufacturing; Transmission belting, leather, manufacturing	336411, 336412, 336414	Aircraft manufacturing; Aircraft turbines manufacturing; Guided missile and space vehicle manufacturing
3221, 322110, 322121, 322130	Pulp mills; Paper (except newsprint) mills; Paperboard mills; Paperboard coating, laminating, or treating in paperboard mills; Leatherboard (i.e., paperboard based) made in paperboard mills	339114	Dental wax manufacturing
322212, 322220, 322230	Folding paperboard box manufacturing; Coating purchased papers for packaging applications; Leatherboard (i.e., paperboard based) made from purchased paperboard; Waxed paper; Notebooks (including mechanically bound by wire or plastics) made from purchased paper	339920	Sporting and athletic goods manufacturing

NAICS Code	Industry Title	NAICS Code	Industry Title
324110	Paraffin waxes made in petroleum refineries	238320	Electrostatic painting, on site, contractors
325199	Plasticizers (i.e., basic synthetic chemicals) manufacturing	238330	Wood floor finishing (e.g., coating, sanding)
325211	Plastics and synthetic resins regenerating, precipitating, and coagulating	48811	Airport operations
3255, 325510, 325520	Water repellant coatings for wood, concrete and masonry manufacturing*; Pipe sealing compounds manufacturing	561990	Firefighting services as a commercial activity
325611, 325612, 325613, 325620	Soap and other detergent manufacturing; Polish and other sanitation good manufacturing; Surface active agent manufacturing; Toilet preparation manufacturing	562111, 562112, 562119	Solid waste collection; Hazardous waste collection; Other waste collection
32591, 325992, 325998	Printing ink manufacturing; Photographic film, paper, plate, and chemical manufacturing; Foundry core oil, wash, and wax manufacturing	5622, 562211, 562212, 562213, 562219	Waste treatment and disposal; Hazardous waste treatment and disposal; Solid waste landfill; Solid waste combustors and incinerators, Other nonhazardous waste treatment and disposal
3261, 326111, 326112, 326113, 326119, 326150, 32619	Plastic product manufacturing; Trash bags, plastics film, single wall or multiwall, manufacturing; Packaging film, plastics, single web or multiweb, manufacturing; Photographic, micrographic, and x-ray plastics, sheet, and film (except sensitized), manufacturing; Motor vehicle moldings and extrusions, plastics, manufacturing; Cushions, carpet and rug, urethane and other foam plastics (except polystyrene), manufacturing; Other plastics product manufacturing	562991	Septic tank and related services
3262, 32629	Rubber product manufacturing	6511519	Firefighter training schools
3261, 326111, 326112, 326113, 326119, 326150, 325619	Plastic product manufacturing; Trash bags, plastics film, single wall or multiwall, manufacturing; Packaging film, plastics, single web or multiweb, manufacturing; Photographic, micrographic, and x-ray plastics, sheet, and film (except sensitized), manufacturing; Motor vehicle moldings and extrusions, plastics, manufacturing; Cushions, carpet and rug, urethane and other foam plastics (except polystyrene), manufacturing; Other plastics product manufacturing	922160	Fire protection
3262, 32629	Rubber product manufacturing	928110	National security (government establishments of the Armed Forces)

(Association of State Drinking Water Administrators, n.d.)[ii]

Another industry that has recently come under scrutiny is the pesticide manufacturing industry. PFAS compounds were found in a pesticide used for mosquito control in Massachusetts. Testing data released in March 2021 indicated that the PFAS contamination may be leaching from fluorinated high-density polyethylene (HDPE) containers. [iii]

Exposures and Health Impacts

Testing on lab animals have shown that exposure to PFOA and PFOS cause tumors; impact immune system, liver, and kidney function; and cause developmental and reproductive toxicity. In humans, increased cholesterol levels have been consistently identified. More limited studies have also shown low infant birth weights, effects on the immune system, cancer, and thyroid hormone disruption. [iv]

Human exposure to PFAS can occur through a myriad of different pathways, including:

- Drinking water – The Environmental Working Group estimates that more than 200 million Americans could have elevated levels of PFAS in their drinking water. [v]

- Food – Contamination with PFAS can occur from pesticides applied to crops, contaminated soil and water used to grow foods, fish or animals with bioaccumulated PFAS, food packaging, non-stick cookware, or food processing equipment.

- Consumer products – Releases during use, biodegradation, or disposal of products that contain PFAS, including carpets, leather and apparel, textiles, paper and packaging materials, etc.

- Occupational exposure – Exposure can occur while handling PFAS chemicals, handling products containing PFAS chemicals (for example firefighters who handle firefighting foam), or from air emissions related to use of these chemicals.

According to the Environmental Working Group, as of January 2021, 2,337 locations in 49 states are known to have PFAS contamination. [v]

Regulatory History

In 2006, based on growing concerns with PFOA and long-chain PFAS, the U.S. Environmental Protection Agency (EPA) invited the eight leading companies in the PFAS industry to join in a global stewardship program. Most companies stopped the manufacture and import of long-chain PFAS, and PFOA and PFOS are no longer manufactured in the US. However, they are still produced internationally.

To monitor new uses and track management of these chemicals, the EPA has issued Significant New Use Rules for several hundred PFA chemicals, which require manufacturers and processors of these chemicals to notify the EPA at least 90 days before beginning the activity. Also, in 2019, the National Defense Authorization Act added 172 PFAS to the Toxic Release Inventory (TRI) chemical list and an additional three were added in 2020. TRI reporting is an annual report done by businesses that manufacture, process, or otherwise use hazardous chemicals as part of their operation. The EPA uses it to track the management of toxic chemicals that may pose a threat to human health and the environment.

The Interstate Technology Regulatory Council (ITRC) maintains a state-by-state database of PFAS Water and Soil Standards and Guidance values. Refer to the following website:

https://pfas-1.itrcweb.org/fact-sheets/

In April 2021, the EPA created the "EPA Council on PFAS" with the intent of better understanding and reducing the potential risks associated with these chemicals. Also, in March of 2021, the EPA proposed the fifth Unregulated Contaminant Monitoring Rule, which would require public water systems sample collection for 29 PFAS chemicals between 2023 and 2025. This information will help regulators to better understand the presence of these chemicals in drinking water systems.

In February 2021, the EPA made final determinations to regulate PFOS and PFOA in drinking water and will move forward with establishing national primary drinking water regulatory standards, otherwise known as Maximum Contaminant Levels (MCLs), for these contaminants.

Some examples of actions taken in different states to investigate and identify sites with PFAS contamination include the following:

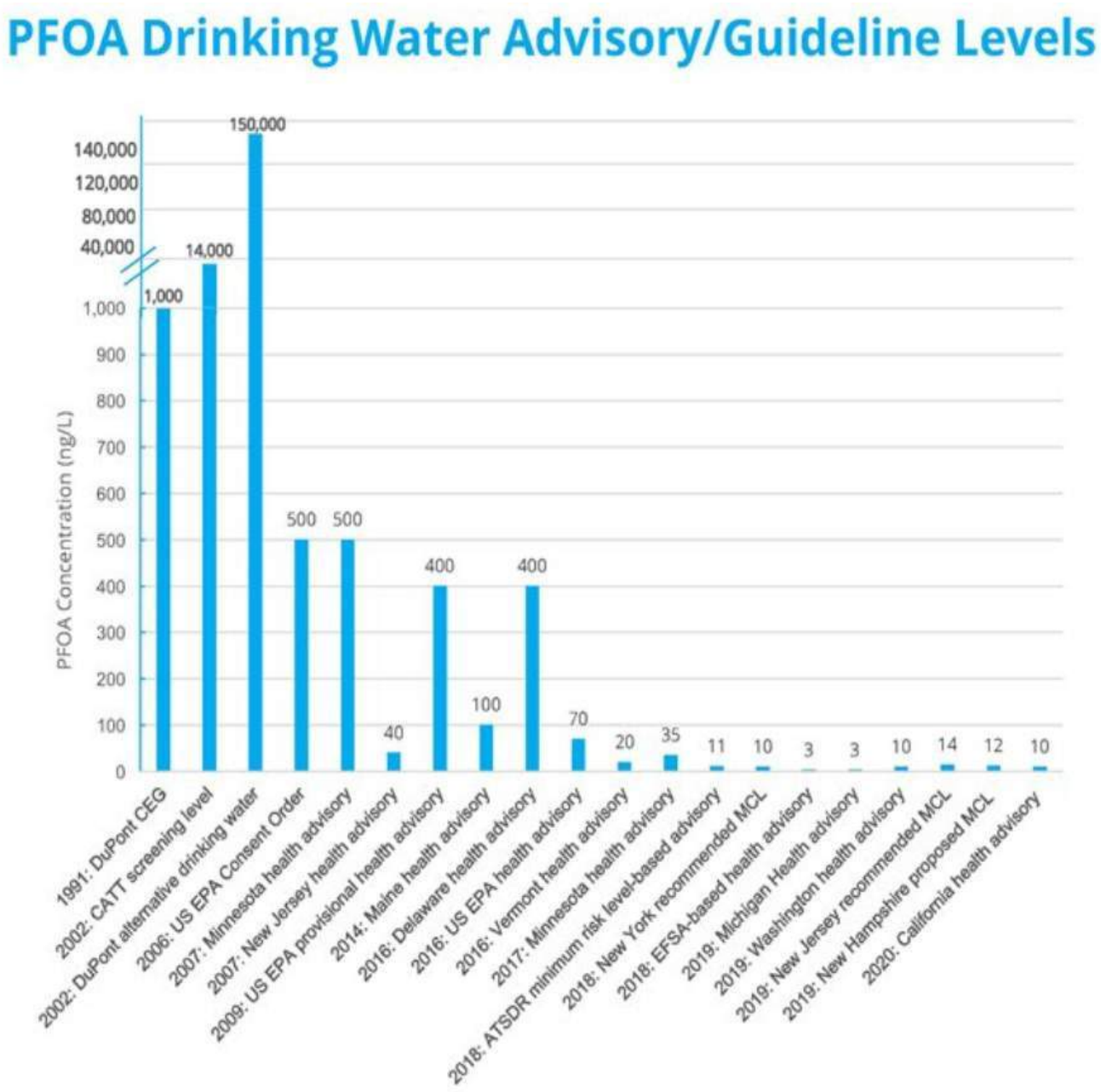
- The California State Water Resources Control Board has implemented a PFAS Investigation Plan. Various industries across the state are being required to submit information about past and present PFAS uses, discharges, monitoring information, etc. and, if any PFAS have been used, then site sampling for PFAS must be conducted.

- New York State Department of Environmental Conservation passed a bill requiring sampling for PFAS at over 1,750 remediation sites.

- New Jersey Department of Environmental Protection is requiring all active and closed sites with institutional or engineering controls to evaluate the potential of PFAS contamination based on historical operations, and to perform sampling, if a potential exists. [vii]

Figure 2 below illustrates how the acceptable levels of PFAS has declined over the years.

Figure 2



(Byroade, Dworschak & Jackson, 2020)[vi]

Legal Repercussions

Many of the past and existing lawsuits for PFAS remediation have involved major manufacturers of PFAS chemicals, such as Dupont. In January 2021, Dupont, along with two companies it spun off, Chemours and Corteva, announced a $4 billion agreement to pay for the costs of PFAS-related remediation lawsuits. In addition, Dupont and Chemours have settled over 3,500 PFAS personal injury claims for over $753 million.[vii] However, potential cleanup and third-party liability will not be limited to those companies that produced PFAS, but instead will include a broad range of companies, including the following:

- Companies that use(d) PFAS chemicals in their operations
- Companies that use(d) products containing PFAS
- Companies that purchase(d) chemicals that contain(ed) PFAS
- Companies that accept(ed) wastes or wastewater contaminated with PFAS
- Companies that use(d) treated wastewater or biosolids contaminated with PFAS
- Companies that purchase(d) properties where contamination with PFAS chemicals has occurred from historic operations

A few examples of recent lawsuits include the following:

A class action lawsuit was filed by the residents of Fairfield, Maine against twelve companies that owned or operated paper mills. The suit alleges that the paper mills generated PFAS-containing biosolids that were spread on local farms. The PFAS chemicals leached into soil and groundwater, impacting drinking water sources.[ix]

Tyco Fire Products recently paid $17.5 million to settle claims from about 300 homeowners in South Carolina who said that aqueous film firefighting foam (AFFF), produced by Tyco, contaminated their drinking water with PFOS. Fifteen million dollars of the claim was allocated for environmental cleanup and another $2.5 million for personal injury for a subset of the plaintiffs.[x]

The Town of Hudson, Massachusetts reached a $1.6 million settlement agreement with Boyd Coating Research Co., Inc., Precision Coating Co. Inc. and Dylan, LLC. These companies develop, manufacture, and apply coatings to devices and parts used in medical, industrial, and aerospace industries. Operations at their facility in Hudson, MA impacted the town's public drinking water supply with PFAS chemicals. The agreement pays for on-going maintenance and operation of the municipal drinking water system. The three companies are also obligated to continue to investigate and remediate PFAS contamination that resulted from their operations.

Insurance Solutions

Securing pollution liability insurance coverage to protect your company from lawsuits related to PFAS chemicals can be difficult. Many insurers have policy limitations or blanket exclusions for PFAS-related claims. However, some carriers will tailor coverage based on information provided by an insured. For historical PFAS use, environmental due diligence, including on-site sampling, may be required. To learn more about current PFAS use, underwriters may need more information about how chemicals are stored and used, and wastes handled in order to craft coverage.

A company seeking pollution liability insurance coverage for PFAS chemicals can benefit from providing environmental due diligence reports for review or by participating in a telephone survey to better help carriers understand current or past PFAS use and controls.

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About Environmental Risk Professionals

Environmental Risk Professionals is a team of highly experienced risk professionals determined to help contractors and other business owners minimize pollution claims. Through Pollution Prevention Practices, Operation and Maintenance Plans and other services, Environmental Risk Professionals helps businesses understand their risk exposure and in turn, mitigate potential claims and effects on the environment.

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