



IN THE SUPERIOR COURT OF THE STATE OF DELAWARE

STATE OF DELAWARE, ex rel.
KATHLEEN JENNINGS, Attorney General
of the State of Delaware,

Plaintiff,

v.

3M COMPANY; TYCO FIRE PRODUCTS
LP; CHEMGUARD, INC.; BUCKEYE
FIRE EQUIPMENT COMPANY;
ARKEMA, INC.; BASF CORP.;
CLARIANT CORP.; ARCHROMA U.S.,
INC.; DYNAX CORP.; AGC CHEMICALS
AMERICAS, INC.; DAIKIN AMERICA,
INC.; CHEMDESIGN PRODUCTS, INC.;
CHEMICALS INC.; DEEPWATER
CHEMICALS, INC.,

Defendants.

C.A. No. _____

TRIAL BY JURY OF 12
DEMANDED

COMPLAINT

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The State of Delaware, *ex rel.* Kathleen Jennings, Attorney General of the State of Delaware (“Delaware” or the “State”), brings this action against Defendants 3M Company f/k/a Minnesota Mining and Manufacturing Company; Tyco Fire Products LP; Chemguard, Inc.; Buckeye Fire Equipment Company; Arkema, Inc.; BASF Corp.; Clariant Corp.; Archroma, U.S., Inc.; Dynax Corp.; AGC Chemicals Americas, Inc.; Daikin America, Inc.; ChemDesign Products, Inc.; Chemicals Incorporated; and Deepwater Chemicals, Inc. (collectively, the “Defendants”), to recover for historic, current, and future injuries to Delaware’s natural resources and property; historic, current, and future losses of ecological services; all past and future costs necessary to protect the public health, safety, welfare and the environment, including costs to monitor, assess, investigate, remediate, and protect private drinking water well resources; comply with applicable environmental cleanup standards, and prevent or remedy the contamination of natural resources, including drinking water and irrigation resources, by eliminating the widespread environmental contamination caused by Defendants; injuries to the public health, including the increased risk of adverse health effects associated with contaminants introduced into Delaware natural resources by Defendants; punitive damages sufficient to punish Defendants’ conscious misbehavior and to deter similar misconduct in the future; and all other appropriate relief that may be ordered by this Court.

I. INTRODUCTION

1. This case centers on Defendants' conduct in designing, manufacturing, marketing, distributing, supplying, and/or selling aqueous film-forming foam ("AFFF") products, and certain chemical ingredients incorporated into those products, resulting in contamination and pollution of Delaware's natural resources and property with toxic per- and polyfluoroalkyl substances ("PFAS").

2. As a result of Defendants' conduct described herein, PFAS compounds traceable to the use and disposal of AFFF products in Delaware now contaminate natural resources including groundwater, surface waters, soils, sediments, fish, and wildlife.

3. PFAS contamination attributable to AFFF product use and disposal has been detected in natural resources located on and near the New Castle County Airport ("NCC Airport") in New Castle County, and the Dover Air Force Base ("Dover AFB") in Kent County.

4. All PFAS are synthetic chemicals that do not occur naturally. PFAS compounds have unique characteristics that render their widespread distribution "one of the most seminal public health challenges for the next decades," as proclaimed by a senior official with the U.S. Center for Disease Control. These chemicals are highly mobile and extremely persistent: they readily spread into the natural environment and degrade very slowly over long periods of time, if at all.

They bioaccumulate and biomagnify: they are absorbed by and build up in other organisms, such as marine animals, birds, and ultimately humans, leading to chronic cumulative exposure to the chemicals even where an organism is directly exposed only to extremely small amounts. Most importantly, these chemicals are toxic: exposure to PFAS chemicals is associated with many adverse health effects, including testicular, kidney, and pancreatic cancer, thyroid disease, liver enlargement, immune system dysfunction, adverse reproductive effects and birth defects, ulcerative colitis, and preeclampsia, among other health effects.

5. Each of the Defendants designed, manufactured, marketed, distributed, supplied, and/or sold PFAS-based AFFF products and/or AFFF components that contain or break down into toxic PFAS, including perfluorooctanoic acid (“PFOA”), perfluorooctane sulfonic acid (“PFOS”), and perfluorohexane sulfonic acid (“PFHxS”), and/or other PFAS compounds, and that, when used as intended, result in significant environmental contamination and pollution with PFAS.

6. AFFF is capable of extinguishing fires involving fuel or other flammable liquids that cannot be effectively extinguished with water alone. To suppress such fires, AFFF is mixed with water and aerated to form a foam solution that is sprayed onto the fire. Accordingly, if used as intended and as designed by Defendants, Defendants’ AFFF products—and the toxic chemicals they contain—are released directly into the environment, seeping into groundwater and soil.

7. Over the past nearly five decades, AFFF products have been most heavily used not to fight active fires, but for many thousands of firefighting training exercises on military installations and air bases, at civilian airports, and at local firefighting training facilities. During each such firefighting or training event, thousands of gallons of AFFF foam solution laced with toxic PFAS may be used, introducing these chemicals into the natural environment as a result.

8. Defendants knew or, at a minimum, should have known about the environmental and human health dangers posed by the ordinary and intended use of their AFFF products.

9. By the late 1970s, 3M Company (“3M”) had confirmed internally that PFOS and PFOA had been detected in human blood, *i.e.*, that the chemicals had spread far beyond the immediate site of their application, and were “more toxic than anticipated.” The company, however, withheld information concerning these chemicals’ toxicity from the U.S. Environmental Protection Agency (“EPA”) and other regulators for decades. One of 3M’s chief scientists eventually resigned over the company’s failure to dedicate sufficient resources to the investigation of PFOS’s harms, calling the chemical the “most onerous pollutant since PCB[.]”

10. The remaining Defendants also knew or, at a minimum, should have known about the toxicity and environmental hazards posed by the key chemical ingredients in their AFFF and/or AFFF component products, including through their

participation in industry trade groups formed for the purpose of lobbying regulators to protect their lucrative AFFF lines of business.

11. Safer alternatives to AFFF not containing or breaking down into toxic PFAS were available when Defendants designed, manufactured, marketed, distributed, supplied, and/or sold the products that are the subject of this Complaint. Indeed, under regulatory pressure, several of the Defendants have altered the chemical make-up of their AFFF products to rely on fluorosurfactants that they claim are less biopersistent and less toxic. Defendants could have made such changes much sooner.

12. Moreover, fluorine-free firefighting foams that can effectively suppress liquid-based fires are available (and have in fact long been used for that purpose by large commercial airports outside the United States) and do not pose the types of harms to the environment and human health that AFFF containing fluorinated substances does. Defendants knew or should have known about this alternative, but never adequately pursued it, electing instead to continue selling their existing lines of AFFF products.

13. Defendants also failed to provide adequate warnings and instructions with their AFFF products, including both before and after selling such products. Defendants failed to adequately advise their customers, the public, and the State, or anyone else, about (i) the harms their PFAS-based AFFF and AFFF component

products posed to the natural environment and human health; (ii) methods of environmentally safe disposal of PFAS-based AFFF products; and (iii) designs of AFFF release sites, including firefighting training sites, that may eliminate or limit the release of PFAS from AFFF into the environment, or otherwise mitigate their detrimental environmental effects.

14. Defendants by their conduct bear ultimate responsibility for the release of vast amounts of PFAS into Delaware's natural environment resulting from the ordinary and intended use of AFFF products, contaminating the State's waterways, waterbodies, aquifers, soils, sediments, fish and animal tissue, and biota, and threatening the health of Delaware's residents.

15. The State is pursuing this action to hold Defendants accountable for their misconduct in causing contamination of natural resources within the State with PFAS and exposing Delaware residents to significant health risks, and seeks to recover for its residents all costs, expenses, and damages associated with Defendants' acts and omissions as further alleged in this Complaint.

16. This action pertains only to Defendants' design, manufacture, marketing, distribution, supply, and sale of AFFF products and chemical ingredients for use in AFFF products.

17. This action does not pertain to or include claims relating to injuries caused by non-AFFF products, including any products containing PFAS compounds

other than AFFF products. Nor does this action pertain to or include claims relating to injuries caused by the use or disposal of PFAS compounds at or from industrial manufacturing, processing, or other facilities, or the use of landfills or other disposal grounds to dispose of PFAS wastes. Claims relating to such injuries may be subjects of a separate action or actions to be initiated by the State.

II. JURISDICTION AND VENUE

18. The natural resources that are the subject of this suit all rest within the State of Delaware. No federal subject-matter jurisdiction exists or is invoked herein.

19. Jurisdiction of this Court is proper under Article IV, Section 7, of the Delaware Constitution and 10 *Del. C.* § 541.

20. This case qualifies for assignment to the Superior Court Complex Commercial Litigation Division because the amount in controversy exceeds One Million Dollars (\$1,000,000).

21. This Court has personal jurisdiction over Defendants because each Defendant is, or was during the relevant time period, incorporated in Delaware or licensed to do business in Delaware; is transacting or has transacted business in Delaware; or has other significant contacts with Delaware. Each Defendant has sufficient contacts with Delaware to give rise to the current action, has continuous and systematic contacts with Delaware, or has consented either explicitly or implicitly to the jurisdiction of this Court.

III. PARTIES

A. PLAINTIFF

22. The State of Delaware, *ex rel.* Kathleen Jennings, Attorney General of the State of Delaware, brings this suit pursuant to its *parens patriae* authority to remedy an injury to its “quasi-sovereign interest” in the physical and economic health and well-being of a substantial segment of its population, and pursuant to its responsibilities and authority as trustee of natural resources, and in its capacity as owner of properties within Delaware.

23. Delaware enjoys *parens patriae* standing in this suit because its residents are adversely affected by the presence of PFAS, including PFOS, PFOA, and/or PFHxS, released from Defendants’ products in the State’s natural resources and/or suffer loss through monetary assessments or expenditures that contribute in part to the investigation, testing, remediation, and cleanup of these chemicals. The PFAS contamination caused by Defendants’ products constitutes injury to Delaware’s natural resources and to other property, resources, and waters of the State, for which Delaware seeks damages, including on behalf of itself and on behalf of its residents, as *parens patriae* to protect public trust resources.

B. DEFENDANTS

24. Defendant **3M Company** f/k/a Minnesota Mining and Manufacturing Company (3M, as defined above) is a publicly traded corporation formed and existing under the laws of the State of Delaware with its principal place of business

at 3M Center, St. Paul, Minnesota 55144. Beginning before 1970 and until at least 2000, 3M designed, manufactured, marketed, sold, and/or distributed AFFF products containing or breaking down into PFAS, including PFOS, PFOA, and PFHxS. Upon information and belief, these 3M products were used and released into the environment within Delaware, including at one or more of the sites discussed in this Complaint.

25. Defendant **Tyco Fire Products LP** (“Tyco”) is a limited partnership formed and existing under the laws of the State of Delaware with its principal place of business at One Stanton St., Marinette, Wisconsin 54143. Tyco is the successor in interest to The Ansul Company (“Ansul” and with Tyco, “Tyco/Ansul”), which beginning in or about 1976 designed, manufactured, marketed, sold, and/or distributed AFFF products containing or breaking down into PFAS, including PFOA. Following Tyco’s acquisition of Ansul, Tyco/Ansul continued to design, manufacture, market, sell, and/or distribute AFFF products containing or breaking down into PFAS. Upon information and belief, these Tyco/Ansul products were used and released into the environment within Delaware, including at one or more of the sites discussed in this Complaint.

26. Defendant **Chemguard, Inc.** (“Chemguard”) is a corporation formed and existing under the laws of the State of Texas with its principal place of business at One Stanton St., Marinette, Wisconsin 54143. Beginning in or around 1998,

Chemguard designed, manufactured, marketed, sold, and/or distributed AFFF products containing or breaking down into PFAS. Upon information and belief, these Chemguard products were used and released into the environment within Delaware, including at one or more of the sites discussed in this Complaint.

27. Defendant **Buckeye Fire Equipment Company** (“Buckeye”) is a corporation formed and existing under the laws of the State of Delaware with its principal place of business at 110 Kings Road, Kings Mountain, North Carolina 28086. Beginning in or around 2004, Buckeye designed, manufactured, marketed, sold, and/or distributed AFFF products containing or breaking down into PFAS. Upon information and belief, these Buckeye products were used and released into the environment within Delaware, including at one or more of the sites discussed in this Complaint.

28. Defendant **Archroma U.S., Inc.** (“Archroma”) is a corporation formed and existing under the laws of the State of Delaware with its principal place of business located at 4000 Monroe Road, Charlotte, North Carolina 28217. Archroma conducts business through the United States, including in Delaware. Archroma is a subsidiary of Archroma Management, LLC, a foreign limited liability company registered in Switzerland. Upon information and belief, Archroma designed, manufactured, marketed, sold, and/or distributed AFFF products containing or breaking down into PFAS. Upon information and belief, these Archroma products

were used and released into the environment within Delaware, including at one or more of the sites discussed in this Complaint.

29. Defendant **Angus Fire Armour Corporation** (“Angus Fire”) is a corporation formed and existing under the laws of the State of Delaware with its principal place of business at 141 Junny Road, Angier, North Carolina 27501. Angus Fire is or was part of the Angus International Safety Group, Ltd. Beginning in or around 1994, Angus Fire designed, manufactured, marketed, sold, and/or distributed AFFF products containing or breaking down into PFAS. Upon information and belief, these Angus Fire products were used and released into the environment within Delaware, including at one or more of the sites discussed in this Complaint.

30. Together, 3M, Tyco, Chemguard, Buckeye, Archroma, and Angus Fire are referred to as the “AFFF Manufacturer Defendants” in this Complaint.

31. Defendant **Arkema, Inc.** (“Arkema”) is a corporation formed and existing under the laws of the Commonwealth of Pennsylvania with its principal place of business at 900 1st Avenue, King of Prussia, Pennsylvania 19406. On information and belief, Arkema was formerly known as Atochem, Inc. and/or is the successor-in-interest to Atochem, Inc. On information and belief, fluorosurfactants manufactured by Arkema and/or Atochem, Inc. were used to manufacture AFFF that

was used and discharged into the environment within Delaware, including at one or more of the sites discussed in this Complaint.

32. Defendant **BASF Corp.** (“BASF”) is a corporation formed and existing under the laws of the State of Delaware with its principal place of business at 100 Park Avenue, Florham Park, New Jersey 07932. Upon information and belief, BASF acquired Ciba-Geigy Corporation and/or Ciba Specialty Chemicals. BASF conducts business through the United States, including in Delaware. Upon information and belief, fluorosurfactants manufactured by BASF and/or Ciba-Geigy Corporation or Ciba Specialty Chemicals, including those trademarked Lodyne™, were used to manufacture AFFF that was used and discharged into the environment within Delaware, including at one or more of the sites discussed in this Complaint.

33. Defendant **Clariant Corp.** (“Clariant”) is a corporation formed and existing under the laws of the State of New York with its principal place of business at 4000 Monroe Road, Charlotte, North Carolina 28205. Clariant conducts business through the United States, including in Delaware. Upon information and belief, Clariant’s fluorosurfactants were used to manufacture AFFF that was used and discharged into the environment within Delaware, including at one or more of the sites discussed in this Complaint.

34. Defendant **Dynax Corp.** (“Dynax”) is a corporation formed and existing under the laws of the State of Delaware with its principal place of business at 103 Fairview Park Drive, Elmsford, New York 10523. Dynax conducts business through the United States, including in Delaware. Upon information and belief, Dynax’s fluorosurfactants were used to manufacture AFFF that was used and discharged into the environment within Delaware, including at one or more of the sites discussed in this Complaint.

35. Defendant **AGC Chemicals Americas, Inc.** (“AGC Chemicals”) is a corporation organized and existing under the laws of the State of Delaware, with its principal place of business located at 5 East Uwchlan Avenue, Suite 201, Exton, Pennsylvania 19341. On information and belief, AGC Chemicals is the North American subsidiary of AGC Inc. (f/k/a Asahi Glass Co., Ltd.). On information and belief, fluorosurfactants designed, manufactured, marketed, and/or sold by AGC Chemicals were used to manufacture AFFF that was used and discharged into the environment within Delaware, including at one or more of the sites discussed in this Complaint.

36. Defendant **Daikin America, Inc.** (“Daikin”) is a Delaware corporation with its principal place of business at 20 Olympic Drive, Orangeburg, New York 10862. On information and belief, fluorosurfactants designed, manufactured, marketed, and/or sold by Daikin were used to manufacture AFFF that was used and

discharged into the environment within Delaware, including at one or more of the sites discussed in this Complaint.

37. Defendant **ChemDesign Products, Inc.** (“ChemDesign”) is a Texas corporation with its principal place of business in Marinette, Wisconsin. Upon information and belief, fluorosurfactants designed, manufactured, marketed, and/or sold by ChemDesign were used to manufacture AFFF that was used and discharged into the environment within Delaware, including at one or more of the sites discussed in this Complaint.

38. Defendant **Chemicals Incorporation** (“Chem Inc.”) is a Texas corporation with its principal place of business in Baytown, Texas. Upon information and belief, fluorosurfactants designed, manufactured, marketed, and/or sold by Chem Inc. were used to manufacture AFFF that was used and discharged into the environment within Delaware, including at one or more of the sites discussed in this Complaint.

39. Defendant **Deepwater Chemicals, Inc.** (“Deepwater”) is a Delaware corporation with its principal place of business in Woodward, Oklahoma. Upon information and belief, fluorosurfactants designed, manufactured, marketed, and/or sold by Deepwater were used to manufacture AFFF that was used and discharged into the environment within Delaware, including at one or more of the sites discussed in this Complaint.

40. Together, 3M, Arkema, BASF, Clariant, Dynax, AGC Chemicals, Daikin, ChemDesign, Chem Inc., and Deepwater are referred to as the “PFAS Manufacturer Defendants” in this Complaint.

IV. FACTUAL ALLEGATIONS

A. PFAS ARE DANGEROUS CHEMICALS THAT THREATEN HUMAN AND ENVIRONMENTAL HEALTH AND SAFETY

41. PFAS are a group of synthetic chemical compounds containing fluorine and carbon atoms. They are known as “surfactants” in that they reduce the surface tension of water. As such, these chemicals have been used for decades in the manufacture of household and commercial products that resist heat, stains, oil, and water, including carpet and clothing treatments, cardboard packaging and leather products, emulsifiers, wetting agents, additives and coatings, processing aids in the manufacture of fluoropolymers such as nonstick coatings on cookware, membranes for clothing that are both waterproof and breathable, and, as relevant here, specialized firefighting foams intended for use with certain kinds of fires.

42. PFAS are synthetic; they do not occur naturally.

43. The two most widely studied types of PFAS are PFOA and PFOS, both synthetic, fully fluorinated organic acids with eight carbon atoms.

44. Although PFOS and PFOA are the most widely studied types of PFAS, the PFAS family includes thousands of different chemicals. Defendants have

incorporated at least dozens of different PFAS chemicals into their AFFF product formulations, including PFOA, PFOS, and PFHxS, among others.

45. PFAS have a number of unique properties that, together, render these chemicals a grave threat to public health and the natural environment.

46. PFAS are mobile and persistent: they readily spread into the natural environment, migrating long distances, where they break down very slowly, if at all.

47. Each of these compounds is characterized by multiple carbon-fluorine bonds, which are exceptionally strong and stable. As such, they are extremely persistent in the environment and resistant to metabolic and environmental degradation. In general, the more carbon atoms a particular compound has, the more environmentally persistent it is likely to be.

48. Although short-chain PFAS compounds (i.e., compounds with six or fewer carbon atoms) are generally expected to persist comparatively less than long-chain PFAS compounds, recent research conducted by Auburn University scientists revealed that benefits associated with such compounds (such as shorter half-life or less biopersistence) may be offset by the greater mobility of those compounds.

49. PFAS compounds easily dissolve in water and are thus mobile in both surface waters and groundwater, and can readily spread in the environment once introduced. They are readily transported through the air as well as the soil and into

groundwater, where they can travel significant distances, including into surface waters.

50. PFAS compounds also bioaccumulate and biomagnify. Bioaccumulation occurs when an organism absorbs a substance at a rate faster than that at which the substance is lost by catabolism and excretion. Biomagnification is the increasing concentration of a substance in the tissues of tolerant organisms at successively higher levels in a food chain.

51. PFAS compounds are extremely stable and persistent and as such, once ingested, they tend to bioaccumulate in individual organisms for a significant period of time, resulting in long-term, chronic exposure to increasing amounts of the compounds.

52. For example, PFAS compounds have been shown to accumulate to levels of concern in fish, reaching concentrations of several thousands of times higher than in water. The compounds have been detected in both wild-caught and farmed fish, as a result of bioaccumulation and/or trophic transfer, i.e. biomagnification up the food chain. Consequently, organisms higher in the food chain—including humans and other mammals—consume comparatively larger amounts of PFAS than organisms lower in the food chain, and are exposed to ever-increasing amounts of these compounds.

53. PFAS compounds further bioaccumulate in the unborn and in infants by crossing the placenta from mother to fetus and by passing to infants through breast milk.

54. Finally and critically, PFAS compounds are toxic. A host of academic and other scientific studies make plain that exposure to or ingestion of PFAS chemicals poses serious health risks to humans and to other organisms.

55. Human epidemiological studies, relied upon by the EPA for purposes of the agency's health advisories on PFOA, have found associations between PFOA exposure and high cholesterol, increased liver enzymes, decreased vaccination response, thyroid disorders, pregnancy-induced hypertension and preeclampsia, and testicular and kidney cancer.

56. Recent research conducted by the National Toxicology Program ("NTP"), a division of the National Institute for Environmental Health Sciences ("NIEHS"), has also linked exposure to extremely small amounts of PFOA to pancreatic cancer.

57. Alarmingly, when discussing the research at a conference on PFAS in June 2019, the director of NIEHS and NTP, Dr. Linda Birnbaum, told attendees that pancreatic tumors are present at "very, very low concentrations from PFOA." Dr. Birnbaum recommended that, to protect human health, the maximum concentration

of PFOA should be 0.1 parts per trillion, or 700 times lower than the current EPA health advisory level of 70 ppt in drinking water.

58. Human epidemiological studies, relied upon by the EPA for purposes of the agency's health advisories on PFOS, have found associations between PFOS exposure and high cholesterol, thyroid disease, and adverse reproductive and developmental effects, including gestational diabetes, preeclampsia, and low birth weight. The EPA has also found that there is suggestive evidence that PFOS may cause cancer in humans. The developing fetus and newborns are particularly sensitive to PFOS-induced toxicity.

59. The World Health Organization's International Agency for Research on Cancer has found that PFOA and PFOS are possibly carcinogenic to humans.

60. The EPA has found that there is suggestive evidence that PFOS and PFOA may cause cancer in humans.

61. A recent meta-analysis of existing epidemiological, toxicological, and mechanistic data pertaining to 26 different PFAS compounds published in the *International Journal of Environmental Research and Public Health* in March 2020 applied the "Key Characteristics of Carcinogens framework for cancer hazard identification" to those compounds.

62. The study found “strong evidence” that many PFAS exhibit three of the ten key characteristics: inducing oxidative stress, suppressing immune system function, and modulating receptor-mediated effects.

63. The study found “suggestive evidence” that some PFAS compounds exhibit other key characteristics, including inducing epigenetic alterations and influencing cell proliferation.

64. Every PFAS compound included in the study exhibited at least one of the ten key characteristics of carcinogens.

65. According to the study, PFOA exhibited as many as five of the ten key characteristics. PFOA induces epigenetic alterations; induces oxidative stress; is immunosuppressive; modulates receptor-mediated effects; and alters cell proliferation, cell death, or nutrient supply. Data was insufficient with respect to the remaining key characteristics.

66. PFOS, perfluorononanoic acid (“PFNA”), and other long-chain PFAS compounds exhibited modulation of receptor-mediated effects, immunosuppression, induction of oxidative stress, and influence of cell proliferation pathways. Perfluorobutanesulfonic acid (“PFBS”), perfluorohexanoic acid (“PFHxA,”) and other short-chain PFAS compounds exhibited modulation of receptor-mediated effects and influence of cell proliferation pathways.

67. Another peer-reviewed study published in 2020 found further evidence that certain PFAS compounds, particularly PFOS and PFOA, result in premature births, decreased fertility, and increased odds of low birth weight. These adverse effects on reproductive health were demonstrated by an analysis of birth outcomes in Oakdale, Minnesota, where a portion of the population faced elevated exposure to PFAS due to long-term contamination of drinking water supplies from industrial waste disposal. The study focused on birth outcomes in the area from 2002 to 2011. Reproductive outcomes improved significantly following the installation of a water filtration facility in Oakdale at the end of 2006, demonstrating the causal relationship between exposure to high level of PFAS in drinking water and reproductive health.

68. In addition, PFAS compounds have been shown to affect growth, learning, and behavior of infants and older children, decrease women's ability to become pregnant, and interfere with the body's natural hormones.

69. On November 16, 2021, EPA further provided the Science Advisory Board PFAS Review Panel with recent scientific data and new analyses that indicate negative health effects may occur at much lower levels of exposure to PFOA and PFOS than had previously been understood, and that PFOA is a likely carcinogen.

70. These EPA analyses underwent peer review, and in 2022, they formed the basis for revised health advisories for certain PFAS, and will be utilized in the

development of Maximum Contaminant Level Goals and a National Primary Drinking Water Regulation for PFOA and PFOS.

71. In June 2022, EPA announced drastically reduced health advisories for PFOA and PFOS, reducing the tolerance for these contaminants from 70 ppt to 0.004 ppt and 0.020 ppt, respectively. 0.004 ppt is 4 parts per quadrillion (“ppq”), and 0.020 ppt is 20 ppq.

72. At the same time, EPA also announced new health advisory levels for several additional PFAS compounds, GenX (10 ppt) and PFBS (2,000 ppt).

73. These significant revisions to EPA’s health advisory levels indicate that any detectable level of PFAS, particularly PFOA and PFOS, in water supplies or natural resources to which humans are exposed is cause for concern and a potential human health issue.

B. PFAS CONTAMINATION IS A NATIONWIDE PROBLEM, AND THE PUBLIC’S UNDERSTANDING OF THESE CHEMICALS CONTINUES TO EVOLVE

74. Given their physical and chemical properties, PFAS chemicals have become widespread in the environment, posing an environmental and human health crisis in Delaware.

75. PFAS compounds have entered Delaware’s natural environment and drinking water sources as a result of the ordinary and intended use and disposal of AFFF products. Release of PFAS compounds to land and water, including

groundwater, from AFFF products is a known and foreseeable consequence of the ordinary and intended use of those products.

76. According to the EPA, between 1999 and 2012, PFAS have been detected in the blood serum of 99% of the U.S. population. The Director of the U.S. Centers for Disease Control's National Center for Environmental Health, Patrick Breysse, described the chemicals in October 2017 as "one of the most seminal public health challenges for the next decades" and estimated 10 million Americans were currently drinking contaminated water. That number has, since 2017, significantly increased. Current estimates provide that over 100 million Americans' drinking water supplies are contaminated with PFAS compounds.

77. This understanding of PFAS contamination as a widespread public health crisis has been slow to evolve, however, and has only fairly recently garnered broad attention. Indeed, although the EPA began to investigate the safety of PFOA and PFOS in or around 1998 following some limited disclosures by 3M and others, the agency did not begin to issue health advisories for these chemicals until January 8, 2009. Even then, it noted merely that "action should be taken to reduce exposure" to drinking water containing levels of PFOA and PFOS exceeding 400 ppt and 200 ppt, respectively.

78. In May 2016, the EPA significantly revised its PFOA and PFOS health advisory, recommending that drinking water concentrations for PFOA and PFOS, either singly or combined, should not exceed 70 ppt.

79. Following the EPA's issuance of the PFOA and PFOS health advisory, the Delaware Department of Natural Resources and Environmental Control ("DNREC") added these PFAS compounds to the list of hazardous substances regulated under the Delaware Hazardous Substance Cleanup Act, 7 *Del. C.* §§ 9101, *et seq.*

80. The Agency for Toxic Substances and Disease Registry ("ATSDR") has proposed minimum risk levels, or MRLs, for PFOA (11 ppt), PFOS (7 ppt), PFNA (10.5 ppt), and PFHxS (70 ppt), based on a comprehensive toxicological evaluation of data concerning these PFAS compounds.

81. The EPA updated its interim health advisory levels for PFOA and PFOS in 2022, dramatically reducing the tolerance for both chemicals by orders of magnitude. For PFOA, the interim health advisory level at present is 0.004 ppt, or 4 parts per quadrillion ("ppq"). For PFOS, the interim health advisory level at present is 0.02 ppt, or 20 ppq.

82. The EPA has promulgated proposed Maximum Contaminant Levels ("MCLs") for PFOA and PFOS of 4 ppt each.

83. The EPA has announced its intention to regulate PFOA and PFOS as “hazardous substances” under federal environmental laws, such as CERCLA.

84. The EPA has also announced its intention to address PFAS in NPDES permits issued by EPA.

85. The EPA further announced that it was initiating three new rulemakings to reduce PFAS contamination by way of wastewater discharges from several key industries.

86. While the federal process unfolds, Delaware must act to protect its natural resources and the health and welfare of Delawareans. Through this lawsuit, Delaware seeks to protect its residents and natural resources from the pervasive contamination with toxic PFAS introduced into the environment as a result of Defendants’ conduct in connection with AFFF products.

C. DEFENDANTS’ AFFF PRODUCTS HAVE FOR DECADES CONTAMINATED THE NATURAL ENVIRONMENT WITH PFAS

87. The PFAS application giving rise to the claims asserted in this Complaint is AFFF, which is widely used to suppress and extinguish fires of flammable liquids, such as fuel and oil.

88. In the 1940s, 3M began to experiment with a process called electrochemical fluorination to create the carbon-fluorine bonds that are the key components of PFAS, including PFOA, PFOS, and PFHxS.

89. The electrochemical fluorination process used by 3M results in both PFOA and PFOS.

90. The other major carbon-fluorine bond producing process, which was used in the manufacture of the surfactants that the remaining AFFF Manufacturer Defendants and PFAS Manufacturer Defendants used in their production of AFFF products, is called telomerization. This process generally results in PFOA and other carboxylates.

91. Recognizing the compounds' strong surfactant properties described above and building on its earlier experiments, 3M began to develop AFFF containing PFOS in the early 1960s to suppress flammable liquid fires that cannot be effectively extinguished with water alone.

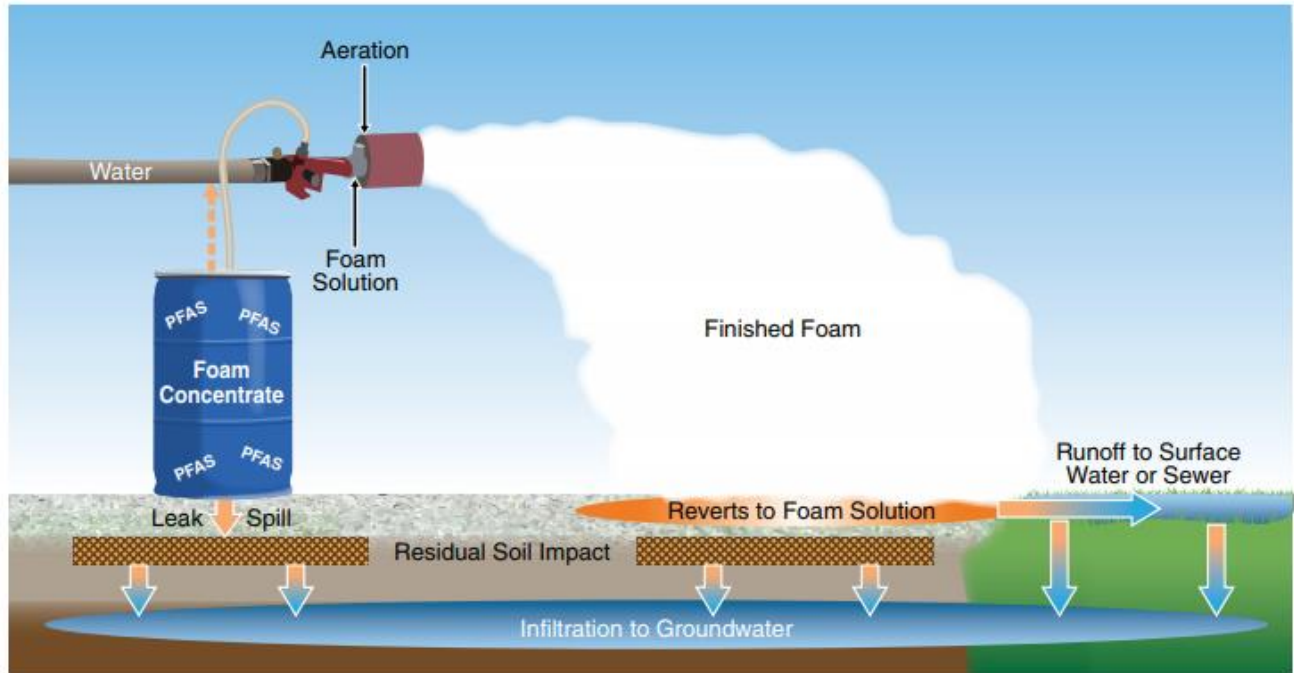
92. In the late 1960s, the United States military issued military specification MIL-F-24385 governing the requirements for AFFF ("AFFF Mil-Spec"). It required that the AFFF concentrate "consist of fluorocarbon surfactants plus other compounds" The AFFF Mil-Spec, however, contained no further requirements concerning these fluorocarbons surfactants, such as the length of the fluorine-carbon chain. The AFFF Mil-Spec also stated that "[t]he material shall have no adverse effect on the health of personnel when used for its intended purpose."

93. The United States government has clarified that the AFFF Mil-Spec "was a *performance* military specification (as opposed to a *detail* military

specification); meaning that the product manufacturers [and not the United States government] determine[d] the exact formulation and specific perfluorocarbon surfactants . . .”

94. From the 1960s to about 1973, 3M was the sole supplier of AFFF. Beginning in 1973, fluorotelomer-based AFFF manufacturers entered the market.

95. AFFF is applied by firefighters in the field by mixing foam concentrate and water to make a foam solution. When applied to a fire, the foam solution is aerated at the nozzle. The foam solution is sprayed out to coat the fire, blocking the supply of oxygen feeding the fire and creating a cooling effect and evaporation barrier. A film also forms to smother the fire after the foam has dissipated:



96. In other words, it is intended by, and foreseeable to, the Defendants that AFFF will be mixed with water and sprayed in such a manner that it can freely seep

into the groundwater and soil and contaminate the environment, unless precautionary measures are taken to prevent its introduction into the environment.

97. A single firefighting event or training exercise may result in the release of thousands of gallons of foam solution laced with PFAS that then enter and contaminate the environment.

98. For decades, PFAS-based AFFF products have been stored and used for fire suppression, fire training, and flammable vapor suppression at hundreds of military installations and civilian airports, as well as at petroleum refineries and storage facilities, fire stations, and chemical manufacturing plants throughout the United States.

99. Additionally, local fire departments in numerous communities have used and maintained quantities of AFFF in their inventories.

100. Fire training exercises and fire suppression systems testing involving AFFF are common, particularly on military installations, and have been performed many thousands of times since the 1960s, each time releasing vast quantities of toxic chemicals into the environment.

101. AFFF use has been identified as one of the main contributors to the widespread environmental contamination with PFAS, including PFOA and PFOS.

102. Despite the phase-out of longer-chain PFAS, current AFFF stockpiles likely still contain long-chain PFAS constituents due to the long shelf-life of these products.

103. Significantly, in recognition of the dangers of PFAS, the AFFF Mil-Spec was amended in September 2017 to state that the Department of Defense seeks “to acquire and use a non-fluorinated AFFF formulation or equivalent firefighting agent to meet [its] performance requirements” and again in April 2020 to make clear that the AFFF Mil-Spec requires only that AFFF “[c]oncentrates shall consist of surfactants plus other compounds...” – not necessarily fluorosurfactants. The current version of the Mil-Spec, published in January 2023, prohibits PFAS in approved AFFF products.

104. Had Defendants been forthright about their products’ chemical properties and the environmental and human health hazards they posed, the Department of Defense (and regulatory agencies) would have taken steps to prevent, control, or minimize the environmental and human health threats from AFFF containing and/or breaking down into PFAS, including PFOA, PFOS, and PFHxS, much sooner, or would never have used them in the first place.

D. THE DEFENDANTS KNEW ABOUT BUT CONCEALED THE DANGERS OF PFAS CONTAINED IN AFFF

105. 3M has known for decades that PFAS compounds, including PFOA and PFOS, are mobile and persistent, bioaccumulative and biomagnifying, and toxic to human and animal life.

106. The remaining Defendants, each of which manufactured PFAS-based AFFF products or supplied fluorosurfactants as components for use in AFFF, likewise knew or, at a minimum, should have known of the dangers to human and environmental health posed by AFFF products, including through information they obtained as part of their participation in trade industry associations.

107. All Defendants were careful to withhold the most damning information about key AFFF ingredients, including PFOS, PFOA, and other PFAS, from the public and regulators.

1. 3M Knew About But Concealed the Dangers of PFAS

108. 3M conducted extensive toxicity studies on PFAS, including PFOS and PFOA, as early as the 1950s, concluding that the chemicals were toxic.

109. Further toxicity studies conducted by 3M scientists in the late 1970s confirmed that the chemicals were even “more toxic than anticipated.”

110. In 1978, 3M conducted studies on monkeys and rats, feeding them various dosages of PFOS and PFOA. All monkeys in the study died within the first few days after being given PFOS at a dosage of 4.5 mg/kg/day. Monkeys being

given 100 mg/kg/day of PFOA “all died during weeks 2 through 5 of the study.” The company’s studies showed that both PFOA and PFOS affected the liver and gastrointestinal tract of the species tested.

111. 3M concluded that PFOS was “the most toxic” of the compounds studied and “certainly more toxic than anticipated.”

112. 3M consulted with Harold Hodge, a well-known toxicologist, who emphasized that it was of “utmost importance” to determine whether these chemicals “or its metabolites are present in man, what level they are present, and the degree of persistence (half-life) of these materials.”

113. Further, in 1975, 3M was alerted by third-party researchers that PFOS was detectable in human blood serum and thus had obviously spread beyond the immediate site of its applications and was bioaccumulating.

114. 3M’s own research confirmed by the next year that the level of fluorochemicals in the blood of its own workers was “1,000 TIMES NORMAL.”

115. Conducting research around its manufacturing plants, 3M knew by 1979 that its fluorochemicals “bioaccumulated more readily in the gastrointestinal tract, fat and reproductive system [at least in] channel catfish[.]”

116. By 1979, 3M recognized that fluorochemicals may pose a cancer risk. Indeed, one of its scientists pressed that it was “paramount to begin now an assessment of the potential (if any) of long term (carcinogenic) effects for these

compounds which are known to persist for a long time in the body and thereby give long term chronic exposure.”

117. 3M nonetheless continued to assure its customers, for example the U.S. Navy, a major purchaser of 3M’s AFFF products (which, by the mid-1970s, had raised concerns about the environmental impact of AFFF releases into the environment), that its products were “biodegradable and will have no adverse effects on the environment.” That assurance was knowingly false.

118. 3M never published its toxicity studies and worked actively to stifle research on the adverse effects of PFOA and PFOS.

119. Indeed, according to evidence developed during litigation pursued by the State of Minnesota against 3M, 3M paid John Giesy, Ph.D., Professor and Canada Research Chair in Environmental Toxicology in the Department of Veterinary Biomedical Sciences and Toxicology Centre at the University of Saskatchewan, millions of dollars for the purpose of influencing independent academic research. It was Prof. Giesy’s professed goal to keep unfavorable papers regarding PFAS out of the academic literature.

120. 3M also advised its employees not to put their thoughts and research concerning PFOS or PFOA to writing, lest such communications would need to be disclosed during discovery in likely litigation.

121. 3M also knew and understood the environmental implications associated with PFOS and PFOA but refused to allow testing to perform precise ecological risk assessments.

122. One of 3M's longtime scientists, Dr. Richard Purdy, stated in an internal email: "PFOS is the most onerous pollutant since PCB and you want to avoid collecting data that indicates that it is probably worse. I am outrage[d.]"

123. Despite 3M's knowledge of PFOS and PFOA toxicity and potential carcinogenicity, its mobility and persistence in the environment, and its tendency to bioaccumulate and biomagnify, the company continued to manufacture, sell, and distribute AFFF containing and/or breaking down into these chemicals until at least 2000.

124. Dr. Purdy resigned shortly thereafter, exhausted by the company's "roadblocks, delays, and indecision" concerning research on PFAS' environmental effects and the company's failure to address their known environmental harms:

- 3M continues to make and sell these chemicals, though the company knows of an ecological risk assessment I did that indicates there is a better than 100% probability that perfluorooctansulfonate is biomagnifying in the food chain and harming sea mammals. This chemical is more stable than many rocks. And the chemicals the company is considering for replacement are just as stable and biologically available. The risk assessment I performed was simple, and not worst case. If worst case is used, the probability of harm exceeds 100,000%.

Dr. Purdy concluded that he could no longer work for a company "concerned with markets, legal defensibility and image over environmental safety."

125. Dr. Purdy copied the EPA on his March 1999 resignation letter.

126. Shortly thereafter, 3M supplemented its prior submissions to the EPA with critical information referenced by Dr. Purdy. In or around 2000, 3M ceased production of PFOS and PFOA.

127. In April 2006, 3M paid a penalty of more than \$1.5 million to the EPA for its failure to disclose pertinent studies regarding PFOA and PFOS.

2. All Defendants Were Aware of the Harmful Effects of AFFF

128. The remaining Defendants also knew or, at a minimum, should have known that in their intended and ordinary use, PFAS-based AFFF products would injure the natural environment and threaten public health.

129. Additionally, all Defendants knew or, at a minimum, should have known that their PFAS-based AFFF and/or AFFF component products, given their chemical composition, easily dissolve in water (and the products were designed to be mixed with water), are mobile, resist degradation, and tend to bioaccumulate and biomagnify.

130. This information was accessible to each of the Defendants because each is an expert with respect to PFAS and AFFF products with an understanding of, and possession of or access to, substantial information about the chemical compounds composing their respective PFAS-based AFFF products.

131. This information was also accessible to the Defendants as part of their ongoing involvement in various trade associations and groups formed for the purpose of defending the AFFF franchise.

132. One such group, the Firefighting Foam Coalition (“FFFC”), was formed in 2001 to dispel concerns the EPA had raised about AFFF’s environmental viability.

133. Many of the Defendants were members of the FFFC during times relevant to the claims in this Complaint, and at least Tyco/Ansul, Chemguard, and Dynax are current FFFC members.

134. E.I. DuPont de Nemours and Co. (“DuPont”), which manufactured fluorinated compounds containing or breaking down into PFAS, was a founding member of the FFFC.

135. DuPont had long known about PFOA’s toxicity, persistence, and tendency to bioaccumulate and biomagnify. By 1961, DuPont’s own researchers had concluded that PFOA was toxic and should be “handled with extreme care” and a few years later, DuPont had knowledge that PFOA caused adverse liver reactions in dogs and rats. By 1976, DuPont was also aware of research reports that detected organic flourine in blood bank samples in the U.S., which the researchers believed to be a potential result of human exposure to PFOA. Through the decades, DuPont had access to mounting evidence of PFOA’s toxicity and negative impact on the

environment, but failed to disclose this information to regulatory agencies and the public at large. Defendants had access to this knowledge by virtue of their industry alliance with DuPont, including their participation in the FFFC and similar industry associations.

136. Through the FFFC, many of the Defendants and DuPont worked together closely to protect AFFF from regulatory scrutiny. This close cooperation, including with respect to messaging on PFOA's toxicological profile, strongly suggests that DuPont shared with or made available to the Defendant FFFC members non-public information concerning PFOA's properties, including its toxicity, persistence, and bioaccumulativity, as part of their joint effort to shield their respective, lucrative AFFF lines of business in the face of their products' foreseeable deleterious impact on natural resources and human health.

137. The FFFC lobbied strenuously for AFFF. The organization regularly published newsletters concerning the viability of telomer-based firefighting foam and had its members attend conferences, all with the express purpose of assuaging worries about the environmental concerns regarding AFFF and downplaying the obvious benefits of AFFF alternatives, such as fluorine-free foam.

138. At an August 2002 conference in Manchester, England, for example, Steve Korzeniowski of DuPont "presented the latest scientific information on telomer-based products, including the fluorosurfactants used in AFFF firefighting

agents.” Korzeniowski discussed the toxicology of PFOS and PFOA, emphasizing that 3M had phased out PFOS-containing AFFF, but that the Defendants continued to produce telomer-based AFFF, which was, purportedly, safer than 3M’s products.

139. The other FFFC members, including multiple Defendants, repeated those messages relentlessly. Indeed, in 2003, the FFFC’s member companies presented the same narrative at the Workshop on Fire Suppression Technologies in Mobile, Alabama, and the NFPA World Safety Conference and Exposition in Dallas, Texas, among other events.

140. Over many years, at conferences throughout the world, in journals, and in meetings with the U.S. military and the EPA, the FFFC repeated this key talking point over and over: Only one PFAS chemical, PFOS, had been taken off the market. They argued that, since the FFFC members’ products did not contain PFOS, their products were safe.

141. The FFFC members’ key message on telomer-based AFFF was knowingly false. Each of the FFFC members’ AFFF products contained or broke down into PFOA and other PFAS, which they knew or, at a minimum, should have known was equally harmful to the environment and public health as was PFOS.

142. The Defendants eventually transitioned to the use of short-chain PFAS with a maximum of six carbon atoms, claiming those chemicals are safer to environmental and human health than the long-chain compounds.

143. These Defendants could have begun to transition from long-chain to short-chain PFAS much earlier.

144. Their failure to avail themselves of what they claim is a feasible alternative to the AFFF products containing or breaking down into PFOA or other long-chain PFAS compounds that they previously manufactured and sold, and which purportedly mitigates the risk of human and environmental harm from AFFF products, confirms that their AFFF products containing long-chain fluorotelomers were not reasonably safe for their intended uses.

145. Additionally, effective fluorine-free firefighting foams that do not pose the same risks to human health and the environment as Defendants' products are available and are being used in some of the world's largest airports, including London Heathrow, London Gatwick, Copenhagen, Stuttgart and Dubai, amongst others. All 27 of Australia's airports have been using fluorine-free foams for many years.

146. Indeed, leading fire safety and regulatory experts have opined that there are simply no justifications for continued use of toxic foams given this successful, widespread use of the environmentally safe alternative.

147. According to a report issued by a panel of experts associated with the International Pollutants Elimination Network (IPEN), a global network of public interest NGOs dedicated to the reduction of toxic chemicals, fluorine-free

firefighting (“F3”) foams are viable alternatives to fluorinated AFFF and comparable by all measures. But unlike fluorinated foams, F3 foams do not pollute the environment indefinitely, or put human or animal health at risk; there is no expensive clean up; remediation costs are negligible or zero; and there are no significant legal and financial liabilities. Public health values such as clean drinking water are not compromised, and, finally, there is no erosion of public confidence in political institutions and government agencies.

148. As of September 2017, the AFFF Mil-Spec had been amended to state that the Department of Defense seeks “to acquire and use a non-fluorinated AFFF formulation or equivalent firefighting agent to meet [its] performance requirements....” And as of April 2020, the AFFF Mil-Spec’s materials requirements no longer called for fluorosurfactants, but only for “surfactants plus other compounds....” And as of January 2023, PFAS chemicals were prohibited from military grade AFFF products.

149. Had Defendants been forthright about their PFAS-based AFFF and AFFF component products’ chemical properties and the environmental and human health hazards they posed, the Department of Defense (and other AFFF users) would have sought to replace existing AFFF with fluorine-free firefighting foam, used successfully abroad, much sooner.

150. Defendants failed to adequately research and investigate the design, manufacture, or sale of fluorine-free firefighting foam, or did so and concealed their results. They avoided fluorine-free alternatives to protect their existing, lucrative AFFF lines of business.

151. Defendants' failure to pursue this feasible alternative to AFFF containing or breaking down into PFOS or PFOA further confirms that their AFFF products were not reasonably safe for their intended uses.

E. DEFENDANTS' AFFF PRODUCTS HAVE CAUSED, AND CONTINUE TO CAUSE, ENVIRONMENTAL CONTAMINATION WITH PFAS IN DELAWARE

152. Defendants' PFAS-based AFFF and AFFF component products have been used for decades throughout Delaware on military bases, civilian airports, and firefighting training centers, including at the New Castle County Airport (NCC Airport, as defined above) in New Castle County, and Dover Air Force Base (Dover AFB, as defined above) in Kent County.

153. PFAS contamination caused by the use of Defendants' AFFF products has been detected in New Castle, Delaware and Dover, Delaware.

154. At the NCC Airport, the Delaware Air National Guard ("ANG") has utilized PFAS-based AFFF products for firefighting training exercises for decades.

155. In Dover, the U.S. Air Force (“USAF”) and the Delaware State Fire School (“DSFS”) have utilized PFAS-based AFFF products for firefighting training exercises for decades.

156. At a minimum, AFFF products containing PFAS were stored, used, and discharged at the following sites within Delaware:

- a. Delaware State Fire School, 1461 Chestnut Grove Road, Dover, Delaware;
- b. Dover Air Force Base, 509 Atlantic Street, Dover, Delaware;
- c. Delaware Air National Guard, 2600 Spruance Drive, New Castle, Delaware; and
- d. New Castle County Airport, 151 N. DuPont Highway, New Castle, Delaware.

157. Defendants manufactured, sold, and/or distributed AFFF and/or AFFF component products containing or breaking down into PFAS, including PFOS, PFOA, and/or PFHxS, that were used at these sites in Delaware.

158. During firefighting and firefighting training exercises at these sites, firefighters sprayed AFFF containing or breaking down into PFAS, including PFOS, PFOA, and/or PFHxS, per its intended use, directly on or near the ground, caused it to be disposed, and spilled it or otherwise caused it to be discharged or released into the environment.

159. Additional discharges and releases at the sites have occurred in connection with storage and handling of AFFF. These activities resulted in foreseeable discharges or releases of PFAS, including PFOA, PFOS, and/or PFHxS, from Defendants' AFFF products into nearby groundwater, soil, and other environmental media.

160. In short, the normal, intended, and foreseeable manner of storage, use, and disposal of Defendants' AFFF products directly resulted in the introduction of PFAS, including PFOA, PFOS, and/or PFHxS, into Delaware's waters, soils, and other natural resources.

161. Upon information and belief, AFFF and/or AFFF component products containing or breaking down into PFAS, including PFOS, PFOA, and/or PFHxS, that were manufactured, marketed, sold, supplied, and/or distributed by each Defendant were discharged or released into the environment at or from these sites.

162. The instructions, labels and/or material safety data sheets that Defendants provided with their AFFF products, if any, during the times relevant to the claims in this Complaint did not fully or sufficiently describe the human and animal health and environmental hazards of AFFF about which Defendants knew or should have known.

163. The instructions, labels and/or material safety data sheets that Defendants provided with their AFFF products, if any, during the times relevant to

the claims in this Complaint did not provide appropriate warnings and instructions concerning the environmentally safe disposal of AFFF that were known or should have been known to Defendants.

164. The instructions, labels and/or material safety data sheets that Defendants provided with their AFFF products, if any, during the times relevant to the claims in this Complaint did not provide appropriate warnings and instructions concerning the risks that, when used and/or disposed of as intended, chemicals contained in AFFF, including PFOS, PFOA, and/or PFHxS, would enter the environment, including by seeping into the groundwater, cause further contamination of environmental media at great distances, would not degrade, and would eventually bioaccumulate and biomagnify in animal tissue, even though these risks were known or should have been known to Defendants.

165. The instructions, labels and/or material safety data sheets that Defendants provided with their AFFF products, if any, during the times relevant to the claims in this Complaint did not provide appropriate instructions regarding precautions that must be taken at firefighting test-sites in a manner that would potentially eliminate or limit the release of PFAS, including PFOA, PFOS, and/or PFHxS, into the environment, even though the hazards of failing to appropriately contain PFAS compounds were known or should have been known to Defendants.

166. For example, instructions to install catch basins or liners under a testing area or outfitting area test-sites with appropriate water filtration systems could have significantly contained the spread of PFAS into the environment. Defendants knew this, but failed to warn or instruct anyone that their products should only be stored, used, and disposed in conjunction with an effective liner or catch basin, or water filtration system capable of removing PFAS.

167. The instructions, labels and/or material safety data sheets that Defendants provided with their AFFF products during the times relevant to the claims in this Complaint, if any, did not provide appropriate warnings of potential groundwater pollution through PFAS nor did they advise the AFFF user to install appropriate safeguards, including water filtration technologies, to protect Delaware's natural resources, even though Defendants knew or should have known about the inevitability of groundwater and soil contamination through their AFFF products and consequent adverse effects in the absence of such measures.

168. Sampling of groundwater, soils, sediments, and/or surface water at or near all of these sites within Delaware shows contamination by PFAS likely to have been introduced by the use of Defendants' AFFF products.

169. At the NCC Airport, groundwater sampling in 2014 revealed concentrations of PFOS as high as 1,800 ppt, as well as PFHxS concentrations as high as 680 ppt and PFOA concentrations as high as 140 ppt.

170. Groundwater sampling in 2019 revealed still larger concentrations of these and other PFAS compounds at NCC Airport. For example, PFOS concentrations detected in 2019 were as high as 16,900 ppt, while PFHxS concentrations were 47,900 ppt, PFOA concentrations were 3,950 ppt, PFNA concentrations were 572 ppt, PFHpA concentrations were 1,120 ppt, and PFBS concentrations were 5,920 ppt.

171. In Dover, the DSFS conducted PFAS sampling in 2016. That sampling revealed concentrations of PFOS as high as 2,060 ppt, while PFOA concentrations were 435 ppt, PFHxS concentrations were 390 ppt, PFHpA concentrations were 190 ppt, and PFNA concentrations were 163 ppt.

172. Groundwater, surface water, soils, and sediments have also been collected and analyzed for PFAS at the Dover AFB.

173. Combined PFOA/PFOS groundwater detections at Dover AFB exceed 1,000,000 ppt in certain locations, and dozens of samples have revealed PFOA and/or PFOS detections up to 100,000 ppt. In addition to PFOS and PFOA, a number of PFAS compounds used in Defendants' AFFF products plague groundwater at the Dover AFB site, including PFHxS, PFHxA, PFPeA, PFHpA, PFBS, and PFBA.

174. Surface waters at and near the Dover AFB similarly suffer AFFF-related PFAS contamination. Surface water samples analyzed for PFAS have revealed concentrations of PFOS of over 1,400 ppt and concentrations of PFHxS of

nearly 1,400 ppt, as well as PFOA and PFHxA concentrations of nearly 400 ppt. Other PFAS compounds used in Defendants' AFFF products detected in surface water samples include PFBA, PFPeA, PFHpA, and PFBS.

175. On-site drinking water samples also revealed elevated concentrations of PFAS compounds used in Defendants' AFFF products, including over 80 ppt of PFOS and over 40 ppt of PFOA.

176. As with water samples, soil samples collected from Dover AFB revealed high concentrations of PFOS, as well as elevated concentrations of PFHxS, PFOA, and PFHxA, among others. Sediment samples collected from Dover AFB, too, reveal high concentrations of PFOS.

177. PFAS compounds used in Defendants' AFFF products have similarly been detected in private wells near Dover AFB.

178. For example, combined PFOA/PFOS concentrations detected in private wells located off-base in 2019 exceeded 170,000 ppt. Businesses and residences in the area are impacted by this contamination.

179. The State's sampling activities to detect PFAS from AFFF in public water supplies, groundwater, surface waters, fish, and other natural resources, including in or around NCC Airport, Dover AFB, the DSFS facility, and other sites, are ongoing.

180. As the State continues its investigation, it may discover other sites that will require remediation or restoration due to contamination with PFAS from AFFF.

181. Delaware has already invested significant sums in a variety of general and site-specific efforts to assess, investigate, monitor, and otherwise respond to PFAS contamination in Delaware natural resources, including drinking water supplies.

182. Delaware and its residents have suffered loss of use of Delaware natural resources, including certain drinking water supplies at or around the NCC Airport and Dover AFB, among other injuries.

V. CAUSES OF ACTION

FIRST CAUSE OF ACTION **PUBLIC NUISANCE**

183. Delaware realleges and incorporates the allegations set forth in paragraphs 1 through 182 as if fully stated herein.

184. The Attorney General is authorized to bring suit on behalf of Delaware and its residents to address a public nuisance.

185. The right to use and enjoy Delaware's natural resources free of harmful PFAS contamination is a right common to the general public.

186. The contamination of Delaware natural resources, including groundwater, surface waters, soils, sediments, fish, and wildlife, with PFAS compounds substantially and unreasonably interferes with Delaware's and its

residents' free use and enjoyment of these natural resources, and constitutes a public nuisance.

187. Defendants designed, manufactured, distributed, marketed, promoted, supplied, and/or sold AFFF and/or AFFF component products that are toxic, cannot be contained once used as intended, tend to bioaccumulate and biomagnify, and are environmentally persistent, and further took affirmative steps to mislead the public and government officials about some or all of these characteristics.

188. Defendants' PFAS-based AFFF products and AFFF component products containing or breaking down into PFAS, such as PFOS, PFOA, and PFHxS, released PFAS into Delaware's natural resources through the ordinary and intended use of those products.

189. The impairments and contamination described herein are both historic and continuing, and Defendants' PFAS pollution of Delaware natural resources has not been adequately abated. Defendants' PFAS pollution continues to circulate and spread in the environment.

190. Until the Delaware resources harmed by PFAS contamination from Defendants' AFFF products and AFFF component products containing or breaking down into PFAS are fully restored to their pre-injury quality, Defendants are liable for the creation and continued maintenance of a public nuisance in contravention of

the public's common right to natural resources unencumbered by PFAS contamination.

191. As a further direct and proximate result of Defendants' creation, participation in the creation, and/or maintenance of a public nuisance, Delaware has incurred, is incurring, and will continue to incur investigation costs, cleanup and removal costs, treatment, monitoring, and restoration costs, and other expenses for which Defendants are jointly and severally liable.

SECOND CAUSE OF ACTION
DESIGN DEFECT

192. Delaware realleges and incorporates the allegations set forth in paragraphs 1 through 182 as if fully stated herein.

193. The Attorney General is authorized to bring suit on behalf of Delaware and its residents to address injuries to Delaware natural resources and the public health arising out of defectively designed AFFF products and AFFF component products.

194. The AFFF and/or AFFF component products containing or breaking down into PFAS, including PFOS, PFOA, and/or PFHxS, designed, manufactured, distributed, marketed, promoted, supplied, and/or sold by Defendants were not reasonably safe as designed at the time they left Defendants' control.

195. The AFFF and/or AFFF component products designed, manufactured, distributed, marketed, promoted, supplied, and/or sold by Defendants are toxic,

cannot be contained once used as intended, tend to bioaccumulate and biomagnify, and are environmentally persistent, and were thus unreasonably dangerous at all relevant times.

196. The AFFF and/or AFFF component products containing or breaking down into PFAS, including PFOS, PFOA, and/or PFHxS, designed, manufactured, distributed, marketed, promoted, supplied, and/or sold by Defendants were unsafe as designed, as demonstrated by numerous studies alleged hereinabove.

197. Due to the toxicity, inability to be contained once used as intended, tendency to bioaccumulate and biomagnify, and persistence of the products they designed, manufactured, distributed, marketed, promoted, supplied, and/or sold, Defendants knew these AFFF and/or AFFF component products were not safe at the time of manufacture because it was certain that the product would contaminate natural resources within the United States, including Delaware, and cause toxic contamination of Delaware natural resources, including those natural resources identified hereinabove.

198. Defendants knew the AFFF and/or AFFF component products they designed, manufactured, distributed, marketed, promoted, supplied, and/or sold were unsafe to an extent beyond that which would be contemplated by an ordinary person because of the information and evidence available to Defendants associating PFAS, including PFOS, PFOA, and/or PFHxS, exposure with adverse human and

animal health effects as well as the overwhelming seriousness of creating extensive contamination of the natural environment.

199. Practical and feasible alternative designs capable of reducing the State's injuries were available. Such alternatives include, by Defendants' own representations, reformulated AFFF containing shorter-chain fluorosurfactants, as well as fluorine-free firefighting foam (F3), which is already widely and effectively being used within and outside of the United States. Such alternative chemical formulations would have materially decreased the environmental persistence and toxicity of Defendants' AFFF and/or AFFF component products without eliminating their typical applications or utilities.

200. Defendants' conduct and the presence of PFAS, including PFOS, PFOA, and/or PFHxS, in Delaware caused and continue to cause injury to the physical and economic health and well-being of Delaware residents.

201. Delaware has suffered and will continue to suffer damages to its natural resources and public fisc as a result of Defendants' conduct and the presence of PFAS, including PFOS, PFOA, and/or PFHxS, released from Defendants' products within the State.

202. Defendants are strictly and jointly and severally liable for all such damages, and the State is entitled to recover all such damages and other relief as set forth below.

THIRD CAUSE OF ACTION
FAILURE TO WARN AND INSTRUCT

203. Delaware realleges and incorporates the allegations set forth in paragraphs 1 through 182 as if fully stated herein.

204. The Attorney General is authorized to bring suit on behalf of Delaware and its residents to address injuries to Delaware natural resources and the public health arising out of Defendants' failures to warn and instruct regarding their AFFF products and AFFF component products.

205. The AFFF and/or AFFF component products containing or breaking down into PFAS, including PFOS, PFOA, and/or PFHxS, designed, manufactured, distributed, marketed, promoted, supplied, and/or sold by Defendants were not reasonably safe at the time they left Defendants' control because they lacked adequate warnings.

206. At the time Defendants designed, manufactured, distributed, marketed, promoted, supplied, and/or sold AFFF and/or AFFF component products containing or breaking down into PFAS, including PFOS, PFOA, and/or PFHxS, Defendants knew their products were not safe because it was certain that PFAS, including PFOS, PFOA, and/or PFHxS, would contaminate natural resources within the United States, including Delaware, and cause toxic contamination of Delaware natural resources, if those products were used as intended.

207. Despite Defendants' knowledge of the attendant risks, Defendants failed to provide adequate warnings and instructions that their products, if used as intended, would adversely affect the natural environment and human health.

208. Despite Defendants' knowledge of the attendant risks, Defendants failed to provide adequate warnings and instructions that their products, if used as intended, would contaminate Delaware natural resources with toxic materials harmful to the environment, wildlife, and human health.

209. Despite Defendants' knowledge of the attendant risks, Defendants failed to provide adequate warnings and instructions concerning the environmentally safe disposal of their products.

210. Despite Defendants' knowledge of the attendant risks, Defendants failed to provide adequate warnings and instructions concerning the precautions that must be taken at firefighting test-sites and other foreseeable sites at which their AFFF and/or AFFF component products would be used, in order to eliminate or limit the release of PFAS, including PFOS, PFOA, and/or PFHxS, into the environment.

211. Defendants continued to conceal the dangers of AFFF and/or AFFF component products containing or breaking down into PFAS, including PFOS, PFOA, and/or PFHxS, after they manufactured, distributed, marketed, promoted, supplied and/or sold such products.

212. Without adequate warnings or instructions, Defendants' products were unsafe to an extent beyond that which would be contemplated by an ordinary person.

213. Defendants' conduct and the presence of PFAS, including PFOS, PFOA, and/or PFHxS, released by Defendants' products in Delaware caused and continue to cause injury to the physical and economic health and well-being of Delaware residents.

214. Delaware has suffered and will continue to suffer damages to its natural resources and public fisc as a result of Defendants' conduct and the presence of PFAS, including PFOS, PFOA, and/or PFHxS, released by Defendants' products within the State.

215. Defendants are strictly and jointly and severally liable for all such damages, and the State is entitled to recover all such damages and other relief as set forth below.

FOURTH CAUSE OF ACTION
NEGLIGENCE

216. Delaware realleges and incorporates the allegations set forth in paragraphs 1 through 182 as if fully stated herein.

217. The Attorney General is authorized to bring suit on behalf of Delaware and its residents to address Defendants' negligence.

218. Defendants failed to exercise ordinary care because a reasonably careful company that learned of its product's toxicity, harmfulness to humans, and

harmfulness to the natural environment would not manufacture, market, promote, supply, sell, and/or distribute that product, or would warn of its toxic and environmentally hazardous properties, or would take steps to enhance the safety and/or reduce the toxicity and environmental persistence of the product.

219. Defendants failed to exercise ordinary care because a reasonably careful company would not continue to manufacture, market, promote, supply, sell, and/or distribute AFFF and/or AFFF component products containing or breaking down into PFAS, including PFOS, PFOA, and/or PFHxS, in mass quantities and to the extent that Defendants manufactured, marketed, promoted, supplied, sold, and/or distributed them.

220. Defendants were grossly negligent because they failed to exercise even slight care, placing revenue and profit generation above human and environmental health and safety.

221. Defendants owed the State and its residents a duty of care in the manufacture, distribution, marketing, promotion, supply, and/or sale of AFFF and/or AFFF component products containing or breaking down into PFAS, including PFOS, PFOA, and/or PFHxS, because it was foreseeable to Defendants that their products, once used as intended, would end up in Delaware's natural resources, including waterways, waterbodies, aquifers, soils, lands and submerged lands, sediments, fish and animal tissue, and biota.

222. Defendants' negligent conduct and the presence of PFAS, including PFOS, PFOA, and/or PFHxS, released from Defendants' products in Delaware caused and continue to cause injury to the physical and economic health and well-being of Delaware residents.

223. Delaware has suffered and will continue to suffer damages to its natural resources and public fisc as a result of Defendants' negligent conduct and the presence of PFAS, including PFOS, PFOA, and/or PFHxS, released from Defendants' products within the State.

224. Defendants are jointly and severally liable for all such damages, and the State is entitled to recover all such damages and other relief as set forth below.

FIFTH CAUSE OF ACTION
TRESPASS

225. Delaware realleges and incorporates the allegations set forth in paragraphs 1 through 182 as if fully stated herein.

226. The Attorney General is authorized to bring suit on behalf of Delaware and its residents to address Defendants' trespass.

227. Defendants' conduct wrongfully contaminated and caused injury to Delaware natural resources, including State-owned properties such as the DSFS facility.

228. Defendants acted intentionally and unreasonably while knowing, or having reason to know, that the State did not give Defendants authorization to act in a manner that would contaminate and cause injury to Delaware natural resources.

229. Due to Defendants' wrongful and intentional conduct in introducing AFFF and/or AFFF component products containing or breaking down into PFAS, including PFOS, PFOA, and/or PFHxS, into Delaware, which Defendants knew would contaminate and cause injury to the natural resources of the State, Delaware suffered and will continue to suffer damages.

230. Defendants' wrongful and intentional conduct in introducing AFFF and/or AFFF component products containing or breaking down into PFAS, including PFOS, PFOA, and/or PFHxS, into the State, which Defendants knew would contaminate and cause injury to the natural resources of the State, was and is the direct factual and legal cause of the injury to Delaware.

231. Defendants are jointly and severally liable for all such damages, and the State is entitled to recover all such damages and other relief as set forth below.

VI. PRAYER FOR RELIEF

Delaware prays for judgment against Defendants, jointly and severally, as follows:

A. Compensatory damages, in excess of \$1,000,000, to Delaware according to proof;

B. Damages for all past, present, and future injury to Delaware natural resources, including the economic impact to Delaware and its residents from loss of ecological services, loss of use value of natural resources, loss of nonuse value of natural resources, and other injuries resulting from the conduct alleged herein;

C. Damages for all past, present, and future costs to assess, investigate, monitor, analyze, remediate, and remove the PFAS contamination that was caused by Defendants' conduct in designing, manufacturing, marketing, distributing, supplying, and/or selling AFFF products and/or AFFF component products that contain or break down into PFAS compounds, and to replace and/or restore all affected natural resources to their pre-injury condition;

D. Punitive damages sufficient to punish Defendants for their conscious misbehavior and to deter others from engaging in similar misconduct;

E. Any other damages permitted by law;

F. Litigation costs and attorneys' fees as permitted by law;

G. Pre-judgment and post-judgment interest on all monies awarded, as permitted by law;

H. Such other and further relief as the Court deems just and proper.

VII. JURY DEMAND

Delaware respectfully requests trial by jury on all claims so triable.

DATED: October 26, 2023

STATE OF DELAWARE

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