

PFAS, Planes, and Problems: PFAS Regulation in the Aerospace and Aviation Industries

I. Introduction

“We’ve done everything that we’re required to do, and we’ll continue to do everything that we’re required to do.”¹

Christina Cassotis, the chief executive officer of the Pennsylvania Allegheny County Airport Authority, faces an impossible predicament.² On the one hand, the Federal Aviation Administration (“FAA”) continues to effectively mandate the use of firefighting foam that contains polyfluoroalkyl substances (“PFAS”) at all Part 139-certified airports, which average Americans travel through every day.³ The PFAS-bearing firefighting foam, known as Aqueous Film Forming Foam (“AFFF”), is arguably the best foam the United States has in terms of quick, safe, petroleum-fire suppression.⁴

On the other hand, while the foam is safe in terms of saving people from airplane fires, it causes cancer, fetal development defects, immune system complications, and liver problems, among other maladies.⁵ The use of AFFF that contains PFAS at airports, airfields, and spaceports, for both emergency and training purposes, introduces PFAS into the natural environment through seepage into groundwater and, most importantly, drinking water.⁶ Because airports and air travel are a vital part of the United States and world economy, keeping passengers and ground control safe is of utmost importance. AFFF-containing PFAS poses a significant threat to the balance between plane passenger and airfield worker safety by allowing a breach of airfield boundaries and harming those that are

1. Oliver Morrison, *PFAS Contamination Is Likely at Pittsburgh Airport. Airports May Face Legal Challenges by Doing Nothing*, ENV’T HEALTH NEWS (Aug. 12, 2019), <https://www.ehn.org/pfas-contamination-is-likely-at-pittsburgh-airport-airports-may-face-legal-challenges-by-doing-nothing-2639773679.html>.

2. *Id.*

3. Safety Enhancements Part 139, Certification of Airports, 76 Fed. Reg. 5510 (Feb. 1, 2011).

4. See Michael G. Stag, *History and Development of Firefighting Foams*, STAG LIUZZA, <https://www.stagliuzza.com/in-the-news/history-and-development-of-firefighting-foams> (last visited Oct. 27, 2023).

5. *What Are the Health Effects of PFAS?*, U.S. AGENCY FOR TOXIC SUBSTANCES & DISEASE REGISTRY (ATSDR), <https://www.atsdr.cdc.gov/pfas/health-effects/index.html> (last reviewed Nov. 1, 2022); *PFOA/PFOS in Drinking Water*, NAT’L SANITATION FOUND. (NSF) (July 2021), <https://www.nsf.org/consumer-resources/articles/pfoa-pfos-drinking-water>.

6. See generally *PFOA/PFOS in Drinking Water*, *supra* note 5.

nearby. Despite knowing PFAS chemicals are toxic since the 1970s⁷ and that international aviation standards have authorized effective PFAS-free firefighting foam alternatives,⁸ the Department of Defense (“DoD”) and the FAA have yet to outright ban the use of AFFF containing PFAS at U.S. airports.⁹

Cassotis’s predicament is pressing. She can choose to either follow the current law, use AFFF, and expose herself to litigation from civilians for PFAS contamination or stop using the toxic foam, and expose herself to litigation from the FAA for violating airport certification legislation.¹⁰

This Comment will explore the development of the double bind many FAA-certified airports find themselves in as a result of the tension between the federal and state governments, PFAS chemical manufacturers, and entities that employ the use of firefighting foam in the aviation and aerospace industries—the FAA, DoD, and National Aeronautics and Space Agency (“NASA”).

Part II will trace the historical evolution of PFAS chemicals, their introduction into society, and federal legislative responses to PFAS-chemical contamination. Part III outlines how PFAS chemicals were introduced into the aviation and aerospace industries as well as legislative and judicial actions that relate to these industry contexts. Part III considers current lobbyist concerns and the respective responses of the FAA, DoD, and NASA regarding PFAS contamination stemming from their actions. Part IV will determine the responsibilities of the FAA and DoD by considering common law theories that have developed in response to data, litigation, legislative recommendations, and international aviation standards.

Finally, Part V will introduce reasons to reject previous justifications approving the use of PFAS chemicals. This Comment concludes by recommending actions the FAA and Congress can take as challenges associated with PFAS contamination continue to loom over the United States.

7. Jared Hayes & Scott Faber, *For Decades, the Department of Defense Knew Firefighting Foams with ‘Forever Chemicals’ Were Dangerous but Continued Their Use*, ENV’T WORKING GRP. (EWG) (Mar. 6, 2022), <https://www.ewg.org/research/decades-department-defense-knew-firefighting-foams-forever-chemicals-were-dangerous>.

8. Melanie Benesh, *It’s Time to Switch to PFAS-Free Firefighting Foams*, ENV’T WORKING GRP. (Apr. 22, 2020), <https://www.ewg.org/news-insights/news/its-time-switch-pfas-free-firefighting-foams>.

9. Safety Enhancements Part 139, Certification of Airports, 76 Fed. Reg. 5510 (Feb. 1, 2011).

10. *Id.*

This Comment is written with a focus toward protecting airports from FAA-imposed liability and safeguarding imperiled water and ecosystems. This Comment, adopting a similar approach to international aviation standards, argues that the FAA and the DoD should ban AFFF that contains PFAS and authorize an effective alternative to be used at all United States airports and spaceports.

II. Background

PFAS chemicals, colloquially known as “forever chemicals,” have impacted the lives of Americans across the country and are unlikely to fade from the foreground of concern anytime soon. As a result, the regulatory status of PFAS in the United States is continually up for debate and rapidly changing.¹¹

A. What Are Per- and Polyfluoroalkyl Substances?

Per- and Polyfluoroalkyl substances (“PFAS”) encompass over 5,000 synthetic fluorinated organic compounds used in commercial products and industrial processes.¹² Introduced into the manufacturing industry in the 1940s, PFAS chemicals were originally developed inadvertently by DuPont de Nemours in 1938.¹³ Scientists recount that the invention of PTFE (polytetrafluoroethylene), the original PFAS Teflon polymer, was “an example of serendipity, a flash of genius, a lucky accident—even a mixture of all three.”¹⁴ In the over eighty years since the invention of the original PFAS chemical, iterations of PFAS chemicals have been incorporated into non-stick cookware, water repellent coatings for clothing and footwear, and even firefighting foam, but the center of PFAS problems is in the aviation and aerospace industries.¹⁵ Despite their extraordinary discovery and multiplicity of uses, PFAS chemicals have

11. Steven M. Siros, *PFAS: The Newest Chemical du Jour*, AM. BAR ASS'N (ABA): TRENDS (Mar. 2, 2020), https://www.americanbar.org/groups/environment_energy_resources/publications/trends/2019-2020/march-april-2020/pfas-the-new-chemical/.

12. Kyle E. Bjornlund & Elizabeth S. Dillon, *Percolating PFAS*, 67 FED. LAW. 11, 11 (2020).

13. *The History of Teflon™ Fluoropolymers*, TEFLON, <https://www.teflon.com/en/news-events/history> (last visited Oct. 27, 2023).

14. *Id.*

15. See Jim Humphreys, *PFAS Chemicals: Origin and History*, JAMES F. HUMPHREYS & ASSOCS. (Feb. 28, 2021), <https://jfhumphreys.com/pfas-chemicals-origin-and-history/>.

significant downsides due to their negative consequences to human health and the environment.¹⁶

PFAS chemicals have been linked to many health concerns including cancer, liver problems, immune system complications, fetal development effects, and thyroid issues.¹⁷ Some research even suggests that PFAS chemicals lower the efficacy of vaccines in children exposed to high levels of PFAS chemicals.¹⁸ The two most common PFAS chemicals are PFOS and PFOA, known to scientists as perfluorooctanesulfonic acid and perfluorooctanoic acid.¹⁹ Notably, PFOS and PFOA have also been the most commonly studied PFAS chemicals.²⁰ The International Agency for Research on Cancer classifies PFOA as a 2B carcinogen,²¹ which indicates that the agent is “[p]ossibly carcinogenic to humans.”²² PFOS and PFOA have been released into the environment through manufacturing practices and can now be found in drinking water supplies located near previous use areas, such as airports and manufacturing plants.²³ Both PFOS and PFOA have chains of eight carbon atoms, most of which are bonded to two or three fluorine atoms; the strength of these carbon-fluorine bonds contributes to their environmental persistence and half-lives of over forty-one years.²⁴ Hauntingly, the Centers for Disease Control and Prevention National Center for Environmental Health reports that PFOA has been detected in the blood of over ninety-eight percent of a representative sample of the United States population.²⁵ The Environmental Protection Agency (“EPA”) also estimates that over six

16. See *What Are the Health Effects of PFAS?*, *supra* note 5.

17. *FACT SHEET: PFOA & PFOS Drinking Water Health Advisories*, EPA (Nov. 2016), https://www.epa.gov/sites/default/files/2016-06/documents/drinkingwaterhealthadvisories_pfoa_pfos_updated_5.31.16.pdf.

18. See *What Are the Health Effects of PFAS?*, *supra* note 5.

19. See *PFOA/PFOS in Drinking Water*, *supra* note 5.

20. *Id.*

21. *List of Classifications: Agents Classified by the IARC Monographs, Volumes 1–134*, INT’L AGENCY FOR RSCH. ON CANCER, <https://monographs.iarc.who.int/list-of-classifications> [<https://perma.cc/QE93-A73Q>] (last updated Oct. 11, 2023, 12:08 PM).

22. *Agents Classified by the IARC Monographs, Volumes 1-134*, INT’L AGENCY FOR RSCH. ON CANCER, <https://monographs.iarc.who.int/agents-classified-by-the-iarc/> [<https://perma.cc/LDB9-XLYV>] (last updated July 27, 2023).

23. *PFOA/PFOS in Drinking Water*, *supra* note 5.

24. Siros, *supra* note 11.

25. Antonia M. Calafat et al., *Polyfluoroalkyl Chemicals in the U.S. Population: Data from the National Health and Nutrition Examination Survey (NHANES) 2003-2004 and Comparisons with NHANES 1999-2000*, 115 ENV’T HEALTH PERSPS. 1596, 1600 (2007).

million Americans' drinking water has PFAS chemical concentrations greater than the EPA recommends to be safe.²⁶

The repercussions of PFAS contamination have even garnered the attention of Hollywood. The 2019 film *Dark Waters*²⁷ is based on the true story of a corporate defense attorney, Robert Bilott, who discovered PFOA contamination in the drinking water of Parkersburg, West Virginia.²⁸ The film follows the story of Bilott's investigation into mysterious animal deaths in the area and the subsequent case he brought against DuPont de Nemours for "knowingly poison[ing] 70,000 residents for decades."²⁹

PFOA, referenced under its colloquial name in the film, C8, was also the subject of a Netflix documentary titled *The Devil We Know*.³⁰ The documentary follows the same DuPont story as *Dark Waters*, but here, the filmmakers focused on the broader impact of C8 contamination on human health and the environment throughout the entire world, not just in West Virginia.³¹ Both *The Devil We Know* and *Dark Waters* illuminate that DuPont knew about the health hazards associated with PFOA yet continued to dump the toxic chemical into the watersheds of local public drinking water supplies.³² Perhaps the most poignant example of the harm the contamination caused, as described in *The Devil We Know*, is the story of Sue Bailey, a former DuPont employee whose son was born with "half of a nose, one nostril, a serrated eyelid and a keyhole pupil where his iris and retina were detached."³³

Thankfully, since 2015, neither PFOA nor PFOS have been manufactured or used in the United States due to growing environmental

26. Xindi C. Hu et al., *Detection of Poly- and Perfluoroalkyl Substances (PFASs) in U.S. Drinking Water Linked to Industrial Sites, Military Fire Training Areas, and Wastewater Treatment Plants*, 3 ENV'T SCI. TECH. LETTERS 344, 346 (2016).

27. DARK WATERS (Participant Media Nov. 12, 2019).

28. Roopal Luhana, 'Dark Waters' Brings Awareness to PFAS Water Contamination Litigation, PITTSBURGH INJ. L. NEWS (Oct. 15, 2019), <https://pittsburgh.legalexaminer.com/health/dark-waters-brings-awareness-to-pfas-water-contamination-litigation/>.

29. *Id.*

30. Kimberly Houghton, 'The Devil We Know' Documentary About PFOA May Be a Film Granite Staters Should See, N.H. UNION LEADER (Feb. 24, 2019), https://www.unionleader.com/news/health/the-devil-we-know-documentary-about-pfoa-may-be-a-film-granite-staters-should-see/article_8ab1da4a-6866-520c-ada5-123ffc894404.html.

31. *Id.*

32. *Id.*

33. Julie Wilson, 'The Devil We Know: How DuPont Poisoned the World with Teflon', ORGANIC CONSUMERS ASS'N (July 31, 2019), <https://organicconsumers.org/devil-we-know-how-dupont-poisoned-world-teflon/>.

and health concerns.³⁴ However, a new concern has emerged, applicable not only to PFOA or PFOS but to all 5,000 PFAS chemicals. Disposing of PFAS chemicals is extremely difficult because, unlike some synthetic chemicals that only bind to lipids and fats, PFAS chemicals can bind to proteins.³⁵ This makes them extremely hard to break down and contributes to their ability to bioaccumulate (the accumulation of a substance in a living organism over time)³⁶ in the human body.³⁷ Additionally, PFAS are difficult to break down due to fluorine's electronegativity and the presence of an incredibly short, stable carbon-fluorine bond.³⁸

The durability of PFAS poses a predicament for the United States government, which must find acceptable PFAS alternatives, mitigate the current and past damage done by PFAS contamination, and regulate current PFAS chemical use.

B. Federal Government Response to PFAS Chemical Problems

While public interest in PFAS chemicals and resulting contamination has expanded in the past decade, the EPA first became aware of the potentially hazardous nature of PFAS in the 1990s.³⁹ Since then, federal and state governments have attempted to regulate and mitigate the threats PFAS pose to human health and the environment. The following subsections will discuss the actions of the EPA and Congress concerning PFAS chemicals.

Every five years, the EPA issues a list of up to thirty unregulated contaminants called the Unregulated Contaminant Monitoring Rule ("UCMR").⁴⁰ Each UCMR requires monitoring public water systems for

34. Rachel Ross, *What Are PFAS?*, LIVE SCI. (Apr. 30, 2019), <https://www.livescience.com/65364-pfas.html>.

35. Marianne Haukås et al., *Bioaccumulation of Per- and Polyfluorinated Alkyl Substances (PFAS) in Selected Species from the Barents Sea Food Web*, 148 ENV'T POLLUTION 360, 361 (2007).

36. *Bioaccumulation*, MERRIAM-WEBSTER, <https://www.merriam-webster.com/dictionary/bioaccumulation> (last visited Nov. 6, 2023).

37. See Haukås et al., *supra* note 35, at 361.

38. *Per- and Polyfluoroalkyl Substances (PFAS): Incineration to Manage PFAS Waste Streams*, EPA (Feb. 2020), https://www.epa.gov/sites/default/files/2019-09/documents/technical_brief_pfas_incineration_ioaa_approved_final_july_2019.pdf.

39. See Scott Faber, *EPA on 'Forever Chemicals': Let Them Drink Polluted Water*, THE HILL (Oct. 1, 2019, 3:00 PM), <https://thehill.com/opinion/energy-environment/463826-epa-on-forever-chemicals-let-them-drink-polluted-water/>.

40. Revisions to Unregulated Contaminant Monitoring Regulation (UCMR 3) for Public Water Systems, 77 Fed. Reg. 26,072 (May 2, 2012) (codified at 40 C.F.R. pts. 141-42).

the listed contaminants.⁴¹ In 2012, the UMCR included PFOS and PFOA, thereby requiring nationwide testing of PFAS chemicals for the first time.⁴² Although PFOS and PFOA must now be monitored, the UMCRs do not create enforceable maximum contamination levels.

In February 2020, the EPA announced its plans to regulate PFAS under the Clean Water and Safe Drinking Water Acts.⁴³ A year later, the EPA Administrator, Michael Regan, announced the agency's plan to implement a PFAS Strategic Roadmap.⁴⁴ This roadmap laid out a “whole-of-agency” approach to addressing PFAS” chemicals and their resulting contamination.⁴⁵ The EPA centered the roadmap on three main directives: (1) Research, (2) Restrict, and (3) Remediate.⁴⁶ Respectively, the agency intended to invest in research to increase its understanding of PFAS toxicity and effects, proactively restrict PFAS from entering the environment, and remediate contamination by “broaden[ing] and accelerat[ing] the cleanup of PFAS contamination.”⁴⁷ Finally, in June 2022, the EPA, pursuant to its Safe Drinking Water authority, replaced outdated drinking-water health advisories by issuing an interim advisory for PFOA and PFOS.⁴⁸ The new safe limits of PFOA and PFOS in drinking water are now 0.0004 parts per trillion (“ppt”) for PFOA and 0.02 ppt for PFOS.⁴⁹ Issuing this interim health advisory alerts citizens that any concentration of PFOA or PFOS above these designated levels is considered dangerous and should not be ingested. The EPA describes health-advisory levels as

41. *Id.*

42. *See id.*

43. Press Release, EPA, EPA Continues to Act on PFAS, Proposes to Close Import Loophole and Protect American Consumers (Feb. 20, 2020), <https://www.epa.gov/news-releases/epa-continues-act-pfas-proposes-close-import-loophole-and-protect-american-consumers>.

44. *PFAS Strategic Roadmap: EPA's Commitments to Action 2021–2024*, EPA, <https://www.epa.gov/pfas/pfas-strategic-roadmap-epas-commitments-action-2021-2024> [<https://perma.cc/AYB2-MVK6>] (last updated Apr. 24, 2023).

45. ZURICH AM. INS. CO., PFAS FOREVER CHEMICALS — REGULATIONS, LITIGATION, NEW TECHNOLOGIES 20 (2022) (graphical presentation), <https://www.zurichna.com/-/media/project/zwp/zna/docs/kh/pfas/zurich-pfas---an-emerging-risk--presentation---may-2022.pdf>.

46. *Id.*

47. *Id.*

48. Lifetime Drinking Water Health Advisories for Four Perfluoroalkyl Substances, 87 Fed. Reg. 36848-02 (June 21, 2022).

49. *Id.*

[providing] information on contaminants that can cause human health effects and are known or anticipated to occur in drinking water. EPA's health advisories are non-enforceable and non-regulatory and provide technical information to state agencies and other public health officials on health effects, analytical methods, and treatment technologies associated with drinking water contamination.

EPA's lifetime health advisories identify levels to protect all people, including sensitive populations and life stages, from adverse health effects resulting from exposure throughout their lives to these PFAS in drinking water.⁵⁰

Thus, like the UCMR the EPA sent out in 2012, the EPA continues to give advisory and non-binding advice—all of which remains unenforceable. Unenforceable advice is wholly inadequate when it comes to regulating toxic PFAS chemicals that plague human and environmental health.

PFAS has become a topic of significant importance in Congress as well.⁵¹ Between 2019 and 2021 alone, congressmembers introduced over fifty bills related to PFAS issues, and Senate and House panels heard over a dozen hearings about PFAS issues.⁵² On July 21, 2021, the U.S. House of Representatives passed House Bill 2467, the PFAS Action Act of 2021, by a vote of 241 to 183.⁵³ The Bill requires the Administrator of the EPA to designate PFAS as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA”) of 1980.⁵⁴ When the EPA finalizes this proposal, any person in charge of a facility with knowledge of the release of one pound or more of PFOA or PFOS must notify the National Response Center within twenty-four hours.⁵⁵ Additionally, the EPA and the DoD may take enforcement action to identify responsible parties and require them to clean up their sites.⁵⁶

50. *Drinking Water Health Advisories for PFAS: Fact Sheet for Communities*, EPA (June 2022), <https://www.epa.gov/system/files/documents/2022-06/drinking-water-ha-pfas-factsheet-communities.pdf>.

51. *Congress Launches Comprehensive PFAS Legislation*, STEPTOE & JOHNSON LLP (Apr. 14, 2021), <https://www.steptoel.com/en/news-publications/congress-launches-comprehensive-pfas-legislation.html?tab=overview>.

52. *Id.*

53. *Id.*

54. PFAS Action Act of 2021, H.R. 2467, 117th Cong. (2021).

55. Ron Tenpas et al., *EPA Proposes to Designate Two PFAS Chemicals as Hazardous Substances Under CERCLA: Quick Answers to Top Questions*, VINSON & ELKINS (Sept. 2,

Outside of the EPA, Congress has proposed multiple federal bills related to PFAS contamination. The Protect Drinking Water from PFAS Act was introduced by Congressman Brendan Boyle to require the EPA Administrator to set a Maximum Contaminant Level for *every* PFAS chemical rather than PFOA and PFOS alone.⁵⁷ Additionally, Senator Tom Udall and Senator Martin Heinrich introduced The Prompt and Fast Action to Stop Damages Act, which seeks to address preexisting PFAS contamination.⁵⁸ If passed, this act would allow Congress to temporarily authorize and support the DoD to provide water for agricultural purposes where Department activities have contaminated a water source with PFAS chemicals.⁵⁹ However, none of the proposed PFAS-related federal bills have been enacted.⁶⁰

III. The Aviation and Aerospace PFAS Problem

While PFAS chemicals have been used in a myriad of industrial and manufacturing processes for the past eighty years, perhaps the most significant use of PFAS has been within the aviation and aerospace industries with AFFF. Since 2004, the FAA has either mandated or constructively mandated the use of foam containing PFAS at all 14 C.F.R. Part 139-certified airports, and approximately 550 airports that average Americans travel through every day are certified.⁶¹ AFFF is a significant and continuous source of PFAS contamination in the United States which affects every community near the watershed of an airport or airfield.

2022), <https://www.velaw.com/insights/epa-proposes-to-designate-two-pfas-chemicals-as-hazardous-substances-under-cercla-quick-answers-to-top-questions/>.

56. *Id.*

57. *See* Protect Drinking Water from PFAS Act of 2021, H.R. 3267, 117th Cong. (2021).

58. Prompt and Fast Action to Stop Damages Act of 2019, S. 675, 116th Cong. (2019).

59. *Id.*

60. *See, e.g.*, PFAS User Fee Act of 2019, H.R. 2570, 116th Cong. (2019); Protecting Communities from New PFAS Act, H.R. 2596, 116th Cong. (2019); Toxic PFAS Control Act, H.R. 2600, 116th Cong. (2019); PFAS Release Disclosure and Protection Act, S. 1507, 116th Cong. (2019).

61. Safety Enhancements Part 139, Certification of Airports, 76 Fed. Reg. 5510 (Feb. 1, 2011).

A. What Is AFFF and Why Is It Used in the Aviation and Aerospace Industries?

Aleksandr Loran, a Russian engineer and chemist, invented the earliest firefighting foam in 1902.⁶² Loran developed firefighting foam to find a substance that could extinguish petroleum fires, as water does not mitigate such a fire.⁶³ The 3M Company and the Naval Research Laboratory joined forces in the 1960s to research PFAS chemicals, specifically PFOA and PFOS, and to develop a more comprehensive and effective fire-fighting foam.⁶⁴ Adding PFAS to AFFF resulted in a more efficient fire control agent.⁶⁵ AFFF without PFAS chemicals paled in comparison in terms of efficiency.⁶⁶ In 1966, the Navy received a patent on its invention and 3M subsequently began manufacturing AFFF containing PFAS for the military.⁶⁷ Thus, today's AFFF was born. By the late 1960s, the Navy required all of its vessels to carry foam containing PFAS chemicals.⁶⁸ Today, the biggest user of AFFF remains the United States military.⁶⁹

Presently, AFFF is a mixture of chemicals, including PFAS, that is commonly used to extinguish flammable liquid fires like petroleum fires and hydrocarbon-fuel based fires.⁷⁰ The synthetic foam has relatively low-viscosity, which allows it to rapidly spread across the surface of flammable liquids and lower the surface tension of the liquid.⁷¹ By lowering the surface tension, AFFF depletes the oxygen supply that fire needs to burn and coats the fuel behind the fire, effectively cooling the

62. Stag, *supra* note 4.

63. *Id.*

64. *Id.*

65. Marko Filipovic et al., *Historical Usage of Aqueous Film Forming Foam: A Case Study of the Widespread Distribution of Perfluoroalkyl Acids from a Military Airport to Groundwater, Lakes, Soils and Fish*, 129 CHEMOSPHERE, June 2015, at 39, 40, <https://www.sciencedirect.com/science/article/pii/S0045653514010650?via%3Dihub>.

66. *Id.*

67. Stag, *supra* note 4.

68. *Id.*

69. *Id.* See generally Jesse Roman, *The New Foam*, NAT'L FIRE PROT. ASS'N (NFPA) J. (July 21, 2022), <https://www.nfpa.org/News-and-Research/Publications-and-media/NFPA-Journal/2022/Fall-2022/Features/Foam> ("For nearly six decades, AFFF has been as indispensable to [military and aviation] jobs as water is for structural firefighters, owing to its unique ability to quickly snuff out even the nastiest liquid fuel fire under a blanket of chemical bubbles.").

70. Complaint at 1, 2, *City of Stuart v. 3M Co.*, No. 2:18-cv-03487 (S.D. Fla. Oct. 18, 2018).

71. Stag, *supra* note 4.

fire and preventing it from reigniting once it has been put out.⁷² AFFF is considered a “Class B” firefighting foam, which is used to extinguish Class B materials like oil, jet fuel, and other types of gasoline.⁷³

When fire creates extremely dangerous circumstances, “AFFF’s qualities as a fast and reliable suppression agent have literally been a lifesaver.”⁷⁴ Jeremy Sousa, former deputy fire chief at T.F. Green Airport in Providence, Rhode Island, explained to the National Fire Protection Association Journal, “Back in the day at the airport, we used this stuff for just about everything short of brushing our teeth.”⁷⁵

AFFF containing PFAS is used at airports, airfields, and spaceports to protect the safety of passengers, crew, and others. The FAA and DoD recognize the unique safety concerns that arise when an extremely effective firefighting agent is replaced with a supposedly less effective alternative that, while less impactful to human bodily health, may jeopardize safety priorities.⁷⁶ Where airport firefighters are exposed to AFFF containing PFAS, however, there are steps they can take to lower their risk of adverse effects. Firefighters are advised to wear personal protective equipment and a self-contained breathing apparatus when working with the foam.⁷⁷ The U.S. Fire Administration also recommends firefighters, immediately after being exposed to AFFF containing PFAS, use a cleaning wipe on their face, neck, and hands and shower within one hour of PFAS exposure.⁷⁸

Prior to 2002, AFFF manufactured by 3M contained polyfluorinated precursors, which degrade into PFOA and PFOS in the environment as

72. Terry Turner, *Aqueous Film Forming Foam (AFFF)*, CONSUMERNOTICE.ORG (Aug. 31, 2023), <https://www.consumernotice.org/environmental/afff/>.

73. *Firefighting Foam and PFAS*, MICH. PFAS ACTION RESPONSE TEAM, <https://www.michigan.gov/pfasresponse/investigations/firefighting-foam> (last visited Nov. 6, 2023).

74. Roman, *supra* note 69.

75. *Id.*

76. *See generally* PAUL CRAMER, BRIEFING TO CONGRESS ON AQUEOUS FILM FORMING FOAM (AFFF) REPLACEMENTS AND ALTERNATIVES, U.S. DEP’T OF DEF. (2022), <https://media.defense.gov/2022/Apr/05/2002970013/-1/-1/0/AFFF-TECHNOLOGIES-REPLACEMENT-AND-ALTERNATIVES-BRIEFING-FEB-2022.PDF>.

77. Jennifer L. Henn, *FAA Persists in Requiring Use of AFFF Foam to Fight Airport Fires*, TOP CLASS ACTIONS (June 29, 2020), <https://topclassactions.com/lawsuit-settlements/medical-problems/cancer-medical-problems/faa-persists-in-requiring-use-of-afff-foam-to-fight-airport-fires/>.

78. Bill, *USFA: The Hidden Dangers in Firefighting Foam*, FIREFIGHTER NATION (Mar. 12, 2020), <https://www.firefighternation.com/health-safety/usfa-the-hidden-dangers-in-fire-fighting-foam/>.

byproducts.⁷⁹ However, starting in 2002, AFFF containing PFOS stopped being sold in the United States.⁸⁰ Yet a significant problem remains: millions of gallons of AFFF that contain PFOS and other PFAS chemicals still exist and remain in use at air and space ports around the country.⁸¹ This stockpile remains because the FAA and DoD have yet to outright ban the use of the product.⁸² Even when the AFFF containing PFAS stock expires, GenX, a new PFAS chemical designed by DuPont, is being used in AFFF as a replacement for PFOS.⁸³

GenX is known as a “‘regrettable substitute,’ whose effects may be as bad as or even worse than the chemical it replaced.”⁸⁴ The FAA and DoD have additionally considered F3 (Fluorine-Free Foam) as a viable AFFF alternative.⁸⁵ F3, however, is a deceptive name because it is not technically fluorine-free.⁸⁶ Rather, F3 only includes a limitation on the content of PFAS allowed.⁸⁷ “Fluorine-free” is a “term used to indicate that the concentrate contains a maximum of 1 [part per billion] PFAS.”⁸⁸ The

79. Stag, *supra* note 4; *see also* Conn. Dep’t of Energy & Env’t Prot. et al., Advisory Information for Aqueous Film Forming Foam (AFFF) Containing Per- and Polyfluorinated Alkyl Substances (PFAS) (June 2019), <https://portal.ct.gov/-/media/CFPC/Foam-Guidance--Final-SPedits-Clean-2019-06-24.pdf>.

80. Ian Ross, *Is the Burst of the AFFF Bubble a Precursor to Long Term Environmental Liabilities?*, INT’L AIRPORT REV. (July 19, 2019), <https://www.internationalairportreview.com/article/98795/fire-fighting-foam-chemicals-water/>. *See generally* Amy Linn, *Toxic Timeline: A Brief History of PFAS*, SEARCHLIGHT NEW MEXICO (Feb. 19, 2019), <https://searchlightnm.org/toxic-timeline-a-brief-history-of-pfas/>.

81. *See* Stag, *supra* note 4.

82. Fed. Aviation Admin., Advisory Circular No. 150/5210-6D, Aircraft Fire Extinguishing Agents (July 8, 2004), https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_150_5210-6D.pdf [hereinafter FAA, Advisory Circular No. 150/5210-6D]; *see also* Roman, *supra* note 69.

83. Ashley Ahearn, *A Regrettable Substitute: The Story of GenX*, ENV’T HEALTH PERSPS. (Mar. 14, 2019), <https://ehp.niehs.nih.gov/doi/10.1289/EHP5134>.

84. *Id.*

85. Fed. Aviation Admin., National Part 139 CertAlert No. 23-01, New Military Specification for Performance-Based Standards for Fluorine-Free Aircraft Fire Fighting Foam (Jan. 12, 2023), <https://www.faa.gov/sites/faa.gov/files/part-139-cert-alert-23-01-F3.pdf> [hereinafter FAA, Part 139 CertAlert No. 23-01].

86. U.S. Dep’t of Def., Fluorine-Free Foam (F3) Military Specification FAQs (Jan. 12, 2023), <https://perma.cc/3HRY-UVAA> [hereinafter F3 Military Specification FAQs].

87. *Id.*

88. U.S. Dep’t of Def., MIL-PRF-32725, Performance Specification: Fire Extinguishing Agent, Fluorine-Free Foam (F3) Liquid Concentrate, for Land-Based, Fresh Water Applications (Jan. 6, 2023), <https://perma.cc/S2J5-MSAY> [hereinafter U.S. Dep’t of Def., MIL-PRF-32725].

importance of this concentration level is discussed at greater length in Part IV. Even amidst the qualification of F3 for use at Part 139 airports, the FAA has yet to concretely state that AFFF will be banned as a result.⁸⁹ Even if AFFF ceases to be used, the contamination will remain for decades.

Due to the predominately liquid nature of AFFF, deploying AFFF for emergency use, and especially for training purposes, results in the direct release of PFAS chemicals into the aqueous environment through seepage into ground water, thereby easily entering and contaminating public drinking-water systems.⁹⁰ Despite growing public concern regarding AFFF, the use of AFFF is currently still allowed by the FAA, so the federal and state governments have recently acknowledged and attempted to rectify the problem.

B. Government Responses to Aviation AFFF Problems

In the aviation and aerospace industries, AFFF that contains PFAS has been the FAA standard for firefighting foam since 2004.⁹¹ As the respective government bodies that determine airport standards and certify airport operations, both the FAA and DoD have refused to outright prohibit its use.⁹² Congress has levied its powers to encourage both the FAA and DoD to phase out foam containing PFAS and look for non-PFAS firefighting foam alternatives, yet neither group has effectively done so because the FAA and DoD firefighting-foam standards have yet to concretely ban PFAS.⁹³

1. The FAA's Action and Inaction Regarding AFFF

Despite the health risks associated with exposure and use of AFFF at commercial airports, spaceports, and military bases around the country, the FAA continues to allow its use, despite recent changes regarding introduction and qualification of F3.⁹⁴ Part 139-airport operator guidance materials require Aircraft Rescue and Fire Fighting services during all air carrier operations.⁹⁵ A key portion of Aircraft Rescue and Fire Fighting

89. FAA, Part 139 CertAlert No. 23-01, *supra* note 85.

90. Filipovic et al., *supra* note 65.

91. FAA, Advisory Circular No. 150/5210-6D, *supra* note 82.

92. *Id.*

93. *Id.*; *see also* Roman, *supra* note 69.

94. *See* FED. AVIATION ADMIN., AIRCRAFT FIREFIGHTING FOAM TRANSITION PLAN (2023), https://www.faa.gov/sites/faa.gov/files/FAA_Aircraft_F3_Transition_Plan_2023.pdf.

95. *Aircraft Rescue and Fire Fighting (ARFF)*, FED. AVIATION ADMIN., https://www.faa.gov/airports/airport_safety/aircraft_rescue_fire_fighting (last updated Sept. 13, 2023).

guidance includes the specifications for what equipment and agents must be located at the airport.⁹⁶ Part 139 also requires airports to have multiple vehicles carrying hundreds of gallons of AFFF for foam production.⁹⁷ After Congress passed the FAA Reauthorization Act of 2018, the FAA was given a hard deadline of October 4, 2021, to permit civilian airports to use firefighting foams without PFAS.⁹⁸ The problem is that October 4, 2021, has long since passed, and the FAA has yet to affirmatively allow airports move to safer, *non-PFAS-containing* firefighting foams—which many airports around the world already use.⁹⁹ Although the FAA has completely missed the target, they have not been totally silent.

On the exact day of the deadline set by Congress, the FAA issued a “CertAlert” to airports informing them they could seek approval for PFAS-free foams and that the FAA would no longer require the use of fluorinated chemicals (i.e., PFAS).¹⁰⁰ The FAA identified that the performance standards set by Part 139 guidelines would remain the same, but the military specification no longer *required* fluorinated chemical use.¹⁰¹ Foam to be used at Part 139 airports must meet the performance standards set by the DoD, no matter if the foam is PFAS-free or not. The FAA admitted in the eleventh hour CertAlert that an “acceptable means of satisfying 14 CFR Part 139 requirements is to continue to use the existing approved foam which contains fluorinated chemicals.”¹⁰² The agency continued on, saying that the “FAA encourages certificate holders that have identified a different foam that meets the performance standard to seek approval for such foam from the FAA.”¹⁰³

While the FAA may view this CertAlert as satisfying the hard deadline set by Congress and even “provid[ing] for flexibility through the

96. 14 C.F.R. § 139.317 (2023).

97. *Id.*

98. FAA Reauthorization Act of 2018, Pub. L. No. 115-254, § 332, 132 Stat. 3186, 3273.

99. Liz Hitchcock, *FAA Must End the Use of Polluting PFA Firefighting Foam*, TOXIC-FREE FUTURE (Oct. 7, 2021), <https://toxicfreefuture.org/blog/faa-must-end-the-use-of-polluting-pfas-firefighting-foam/>.

100. Fed. Aviation Admin., National Part 139 CertAlert No. 21-05, Part 139 Extinguishing Agent Requirements (Oct. 4, 2021), <https://www.faa.gov/sites/faa.gov/files/part-139-cert-alert-21-05-Extinguishing-Agent-Requirements.pdf> [hereinafter FAA, Part 139 CertAlert No. 21-05].

101. *Id.*; see also FAA, Advisory Circular No. 150/5210-6D, *supra* note 82.

102. See FAA, Part 139 CertAlert No. 21-05, *supra* note 100.

103. *Id.*

provisions outlined in 14 CFR § 139,”¹⁰⁴ the FAA has missed the point. Even after an F3 was introduced through the DoD military specification program, the FAA stated, “Certificated Part 139 airports will not be required by the FAA to transition to the new F3. Airport operators are authorized to continue using Aqueous Film Forming Foam (AFFF).”¹⁰⁵

Not only is there no clear path for airports to independently achieve approval of PFAS-free firefighting foams, but PFAS foams are essentially still required at airports in the United States because PFAS foams (including F3 as a result of its technical specifications) are the only firefighting foams able to meet the strict military performance specifications set by the DoD and required by the FAA, even though they now no longer *require* fluorinated-chemical use.¹⁰⁶ The DoD and the FAA have, however, notably joined forces to find a firefighting foam that “ensures the protection of the flying public” and has no impact on human health and the environment.¹⁰⁷ The FAA clearly notes, “While FAA and DoD continue the national testing effort, the FAA reminds all Part 139 airport operators that while fluorinated foams are no longer required, the existing performance standard for firefighting foam remains unchanged.”¹⁰⁸ Part 139 airports “will remain in compliance through use of an approved firefighting foam that satisfies the performance requirements.”¹⁰⁹ Contrary to intent of the FAA CertAlerts regarding AFFF and Congress’s 2018 FAA Reauthorization direction, if Part 139-certified airports wish to remain certified, they have no choice but to continue using foams that contain PFAS.

2. *The DoD’s Action and Inaction Regarding AFFF*

The DoD is responsible for publishing the first required use of AFFF for firefighting purposes.¹¹⁰ In 1969, the DoD issued a military specification (“MILSPEC” or “mil-spec”) requiring the use of AFFF at military bases for firefighting.¹¹¹ Subsequently, the FAA adopted the use of AFFF and required AFFF to be used at FAA-certified Part 139

104. *Id.*

105. FAA, Part 139 CertAlert No. 23-01, *supra* note 85.

106. FAA, Part 139 CertAlert No. 21-05, *supra* note 100; Hitchcock, *supra* note 99.

107. FAA, Part 139 CertAlert No. 21-05, *supra* note 100.

108. *Id.*

109. *Id.*

110. *Aqueous Film Forming Foam (AFFF) Fact Sheet*, HRP ASSOCs., https://hrpassociates.com/uploads/files/AFFF_Fact_Sheet-Email.pdf (last visited Nov. 6, 2023).

111. *Id.*

airports.¹¹² Unlike the FAA, the DoD addressed PFAS contamination resulting from its AFFF use at its airfields by designating a specific “PFAS Task Force.”¹¹³ The DoD is leading the way by limiting the use of AFFF to emergency events and no longer using AFFF for land-based testing and training.¹¹⁴ The DoD plans to phase out the use of AFFF containing PFAS by October 2024, as directed by the National Defense Authorization Act of 2020.¹¹⁵ Additionally, the DoD has adhered to the federal cleanup law, CERCLA, which provides the Department with a consistent framework for nation-wide PFAS cleanup.¹¹⁶

The DoD is arguably doing more to address the impact from its use of AFFF that contains PFAS and the resulting contamination. However, without adopting and mandating the usage of a PFAS-free firefighting foam, the FAA predicament persists because the FAA certification standards mirror the DoD specifications for firefighting foam.

The DoD sets United States Military Standards, commonly referred to as mil-specs.¹¹⁷ Mil-specs are used to standardize materials used in the United States Armed Forces.¹¹⁸ AFFF-containing PFAS is a material designated and approved by the DoD.¹¹⁹ However, mil-spec MIL-PRF-24385F(SH), the specification requiring the use of foams containing PFAS, allows the use of firefighting foams *without* fluorine.¹²⁰ Notably absent from the specification is an outright ban on the use of fluorine foams.¹²¹ As a result, it is clear that PFAS-containing firefighting foams are still acceptable to continue using, and there is no requirement to cease use.

112. FAA, Part 139 CertAlert No. 21-05, *supra* note 100.

113. *PFAS Task Force: Goals & Objectives*, U.S. DEP’T OF DEF., <https://www.acq.osd.mil/eie/eeer/ecc/pfas/tf/index.html> (last visited Nov. 6, 2023).

114. *Id.*

115. National Defense Authorization Act for Fiscal Year 2020, Pub. L. No. 116-92, § 322(c), 133 Stat. 1198, 1308 (2019).

116. David Vergun, *DOD Officials Discuss Fire-Fighting Foam Replacement, Remediation Efforts*, U.S. DEP’T OF DEF. (Sept. 16, 2020), <https://www.defense.gov/News/News-Stories/Article/Article/2349028/dod-officials-discuss-fire-fighting-foam-replacement-remediation-efforts/>.

117. FAA, Part 139 CertAlert No. 21-05, *supra* note 100.

118. *What Is Mil-Spec and Why Should You Care?*, STNGR USA (Aug. 25, 2022), <https://www.stngrusa.com/what-is-mil-spec-and-why-should-you-care/>.

119. *Id.*

120. U.S. Dep’t of Def., MIL-PRF-24385F(SH) w/Amendment 2, Performance Specification: Fire Extinguishing Agent, Aqueous Film-Forming Foam (AFFF) Liquid Concentrate, for Fresh and Sea Water (Sept. 7, 2017), <https://perma.cc/2J55-8ULJ>.

121. *Id.*

Not only is there no requirement to end the use of AFFF that contains PFAS, but any fluorine-free foam purported to be used in an FAA-certified Part 139 airport must meet current mil-spec performance standards and requirements.¹²² Even amidst recent changes in DoD and FAA guidance regarding F3, F3 still has the potential to contain PFAS.¹²³ This has resulted in a constructive failure of MIL-PRF-24385F(SH)'s goal to decrease use of firefighting foam that contains PFAS by the United States military and subsequently civil aviation industry.¹²⁴

3. NASA's Action and Inaction Regarding AFFF

Airplanes are not alone in requiring PFAS foam use; rockets and spacecraft can catch on fire too. NASA has addressed its use of AFFF that contains PFAS at its facilities and spaceports through its Aqueous Film Forming Foam Policy.¹²⁵ Since March 2021, a NASA Interim Directive has been under development to specify "AFFF management practices to minimize the potential impacts of AFFF use and management."¹²⁶ The Directive requires NASA to store AFFF with PFOS or PFOA concentrations over 800 parts per billion (maximum permissible levels from MILSPEC MIL-PRF-24385F), also known as "legacy AFFF," to be properly disposed of to prevent continued use.¹²⁷ Additionally, NASA is to stop using AFFF for training firefighting personnel and will use alternative non-PFAS foam options to test equipment.¹²⁸

However, NASA notes that fixed systems (like permanent fire suppression systems in airplane hangars) "that contain legacy AFFF are not required to replace the foam until an equally effective fluorine free foam is available."¹²⁹ NASA's AFFF Policy goes on to say, "Should a fixed system discharge its contents either intentionally to suppress a fire, or accidentally, then the replacement AFFF must meet MILSPEC MIL-

122. See FAA, Part 139 CertAlert No. 21-05, *supra* note 100.

123. F3 Military Specification FAQs, *supra* note 86.

124. *Fire-Extinguishing Foam Research*, FAA, <https://www.airporttech.tc.faa.gov/Airport-Safety/Aircraft-Rescue-Fire-Fighting/Fire-Extinguishing-Foam-Research> (last visited Nov. 6, 2023).

125. Memorandum from Joseph Mahaley, Assistant Adm'r, OPS, NASA et al. to All NASA Centers and Facilities: Aqueous Film Forming Foam (AFFF) Policy (Mar. 17, 2021), <https://perma.cc/TET6-YH2Q>.

126. *Id.* at 1.

127. *Id.* at 1-2.

128. *Id.* at 2.

129. *Id.*

PRF-24385F”¹³⁰ NASA is essentially in the same predicament the FAA finds itself in, where the only way for spaceports and NASA Centers to comply with the current performance standards is by using foam containing PFAS.

By continuing to allow the use and storage of AFFF that contains PFAS chemicals, the FAA, DoD, and NASA all perpetuate the environmental and human-health harms that PFAS chemicals inflict.

C. Legislative Actions to Regulate AFFF

Congress has recognized the unique concern of PFAS contamination in the aviation and aerospace industries. In recognizing this predicament, Congress has proposed several bills relating specifically to AFFF and PFAS contamination at airports as well as other aerospace and aviation-related military facilities. These bills aim to stop the use of AFFF that contains PFAS and to provide guidelines preventing further PFAS contamination at United States airports.

1. National Defense Authorization Act

While the first National Defense Authorization Act (“NDAA”) containing any mention of PFAS was introduced in Fiscal Year 2018,¹³¹ Congress is significantly concerned with PFAS and the military’s excessive use of it, specifically within the aviation and aerospace fields. Every fiscal year since 1961, the NDAA has recurring updates that appropriate funds and set policies on how the DoD can spend those funds.¹³² Congress confronted the PFAS-AFFF problem head on with the Fiscal Year 2020 National Defense Authorization Act.¹³³ The 2020 NDAA required the DoD to test firefighters’ blood levels for PFAS as a part of their yearly physicals.¹³⁴ Additionally, the bill required the Department to cease the use of AFFF that contains PFAS during training activities at Department installations.¹³⁵ Notably, the bill expects the DoD

130. *Id.*

131. *See* National Defense Authorization Act for Fiscal Year 2018, 115 Pub. L. No. 91, § 316, 131 Stat. 1283, 1350-51 (2017).

132. Tom Barkley, *National Defense Authorization Bill (NDAA): How It Works*, INVESTOPEDIA (Nov. 29, 2022), <https://www.investopedia.com/national-defense-authorization-act-5113289>.

133. *See* National Defense Authorization Act for Fiscal Year 2020, Pub. L. No. 116-92, §§ 322-324, 133 Stat 1198, 1307-10 (2019) (banning the use of PFAS by the military).

134. *Id.* § 707, 133 Stat. at 1441.

135. *Id.* § 324, 133 Stat. at 1310.

to phase out the use of AFFF that contains PFAS by October 2024.¹³⁶ Further, to facilitate studies of PFAS and its human health effects, the NDAA authorized \$10 million for studies from the National Institute for Occupational Safety and Health.¹³⁷

The following year, Congress passed the Fiscal Year 2022 NDAA. Section 344 of the Act, titled “Review and guidance relating to prevention and mitigation of spills of aqueous film-forming foam,” states that “[n]ot later than 180 days” after the Act is enacted, “the Secretary of Defense shall complete a review of the efforts of the DoD to prevent or mitigate spills of aqueous film-forming foam.”¹³⁸ The section also outlines guidance and requirements for the use of personal protective equipment for those who may come into contact with AFFF and guidance for AFFF remediation and clean-up efforts.¹³⁹ While section 344 focuses on AFFF spill prevention and mitigation, the Act lists PFAS as a topic of consideration throughout the entirety of Title III, Subtitle D—“Treatment of Perfluoroalkyl Substances and Polyfluoroalkyl Substances.”¹⁴⁰

2. FAA Reauthorization Act

Every few years, Congress “reauthorizes” the FAA by enacting legislation to set the FAA’s policy priorities and fund the agency for a set number of years.¹⁴¹ On October 5, 2018, the FAA Reauthorization Act of 2018 was signed into law.¹⁴² This bipartisan, five-year authorization of the FAA extended FAA funding through fiscal year 2023 and “represented the first significant multi-year reauthorization since the FAA Modernization and Reform Act of 2012, and the first five-year reauthorization since 1982.”¹⁴³ Importantly, a multi-year reauthorization

136. *Id.* § 322(c), 133 Stat. at 1308.

137. *National Defense Authorization Act (NDAA) PFAS Provisions*, FAMA/FEMSA GOVERNMENTAL AFFS. COMM. (Jan. 2, 2020), <https://famafemsagac.org/national-defense-authorization-act-ndaa-pfas-provisions/>.

138. National Defense Authorization Act for Fiscal Year 2022, Pub. L. No. 117-81, § 344, 135 Stat. 1541, 1644-45 (2021).

139. *Id.*

140. National Defense Authorization Act for Fiscal Year 2022, tit. III, subtitle D, 135 Stat. at 1640.

141. *FAA Reauthorization*, AERONAUTICAL REPAIR STATION ASS’N (ARSA), <https://arsa.org/legislative/issues/aviation-policy/faa-reauthorization/> (last visited Nov. 6, 2023).

142. *FAA Reauthorization*, FAA, <https://www.faa.gov/about/reauthorization> (last updated June 21, 2019) [hereinafter FAA, *FAA Reauthorization*]. See generally FAA Reauthorization Act of 2018, Pub. L. No. 115-254, § 332, 132 Stat. 3186, 3273.

143. FAA, *FAA Reauthorization*, *supra* note 142.

of the FAA frees the agency from short-term extensions that are more uncertain and creates a longer-term framework of reliable funding.¹⁴⁴ Multi-year FAA reauthorization bills also allow the agency to engage in long-term planning for the growth and maintenance of aviation infrastructure, including the development of PFAS-free firefighting foam alternatives and their eventual certification through Part 139–FAA airport certification.

One critical priority outlined in the 2018 Reauthorization Act relates to PFAS and AFFF use at commercial airports. Prior to the 2018 Reauthorization Act, civilian and commercial airports subject to Part 139¹⁴⁵ were subject to FAA aircraft rescue and fire fighting (“ARFF”) rules that mandated using and stocking PFAS-based firefighting foam.¹⁴⁶ Section 332 of the 2018 Reauthorization Act responds to increasing public concern about PFAS-containing firefighting foams that hurt not only the airport fire fighters who work with the chemicals but the civilians living near airports who only have access to polluted drinking water.¹⁴⁷ In section 332, Congress gave the FAA three years to change its requirements relating to ARFF and to allow airports to use firefighting foams that do not contain PFAS chemicals.¹⁴⁸ Congress set October 4, 2021, as the deadline for the FAA to allow Part 139 airports to use non-PFAS-containing firefighting foams.¹⁴⁹ As explained before, PFAS chemicals are still regularly used at United States airports, and Congress’s goal for the FAA has clearly not been met.

3. Preventing PFAS Runoff at Airports Act

Congress has continued to comment on PFAS and its use in the aviation field outside of the military context. In February 2022, a bipartisan group of Senators introduced legislation to reduce the spread of PFAS contamination at commercial airports.¹⁵⁰ Titled Preventing PFAS

144. *Id.*

145. *Part 139 Airport Certification*, FAA, https://www.faa.gov/airports/airport_safety/part139_cert (last updated Oct. 3, 2023).

146. *Aircraft Rescue and Fire Fighting (ARFF)*, FAA, https://www.faa.gov/airports/airport_safety/aircraft_rescue_fire_fighting (last updated Sept. 13, 2023).

147. Hitchcock, *supra* note 99.

148. FAA Reauthorization Act of 2018, Pub. L. No. 115-254, § 332, 132 Stat. 3186, 3273.

149. *Id.*

150. Press Release, Shelly Moore Capito, Colleagues Introduce Bipartisan Bill to Reduce Spread of Toxic PFAS at Commercial Airports (Feb. 18, 2022), <https://www.capito.senate>.

Runoff at Airports Act, the bipartisan bill allocated more FAA funding to commercial airports to purchase testing devices for their firefighting equipment that, in turn, limit the discharge of PFAS chemicals.¹⁵¹

Incentivizing commercial airports to purchase the testing devices (also known as input-based testing systems) aids the FAA in not only limiting PFAS-chemical discharge but preventing exposure of the professionals that work with it and of the local residents surrounding commercial airports.¹⁵² As one Senator noted, “The FAA requires regular testing of firefighting equipment, which may . . . lead to the discharge of harmful chemicals like PFAS.”¹⁵³

Additionally, the Preventing PFAS Runoff at Airports Act granted funding from the FAA Airport Improvement Program to commercial airports, and it directed the FAA to consider options to reimburse airports already using the input-based testing systems before the bill became law in December 2022.¹⁵⁴ After the bill’s unanimous passage in the Senate, one Senator commented, “PFAS contaminations around airports is a serious problem with a very easy solution. With simple testing solutions that are already funded under the Federal Aviation Administration’s Airport Improvement Program, we can protect the environment without creating more burdensome regulations on small airports.”¹⁵⁵ In December 2022, the Preventing PFAS Runoff at Airports Act became law and Congress directed the FAA to *specifically* fund PFAS remediation projects as a part of the Airport Improvement Program.¹⁵⁶ Since December 2022, however, it has yet to be seen if the FAA will meaningfully comply.¹⁵⁷

gov/news/press-releases/capito-colleagues-introduce-bipartisan-bill-to-reduce-spread-of-toxic-pfas-at_commercial-airports.

151. Preventing PFAS Runoff at Airport Act, S. 3662, 117th Cong. (2022) (enacted).

152. Capito, *supra* note 150.

153. *Id.*

154. Preventing PFAS Runoff at Airport Act, S. 3662, § 2 (a), (c).

155. *Senate Unanimously Passes Bipartisan Legislation Led by Senator Lummis to Reduce the Spread of Toxic PFAS at Commercial Airports*, CYNTHIA LUMMIS (Sept. 12, 2022), <https://www.lummis.senate.gov/press-releases/senate-unanimously-passes-bipartisan-legislation-led-by-senator-lummis-to-reduce-the-spread-of-toxic-pfas-at-commercial-airports/>; see also Morrison, *supra* note 1. Senator Lummis’s assertion of “already funded” testing solutions, however, is not as simple as it may seem. Currently, the FAA has failed to cover the costs of PFAS remediation and testing solutions specific to PFAS through its Airport Improvement Program. *Id.*

156. Preventing PFAS Runoff at Airport Act, S. 3662, § 2(a).

157. *Id.*

D. Various State Government Responses

Outside of the federal government, eleven states have responded to the general PFAS and AFFF contamination crises on their own terms through various approaches.¹⁵⁸ States have utilized Multi-District Litigation suits to seek justice for PFAS contamination in their respective states.¹⁵⁹ While the EPA's guidelines regarding PFAS were purely advisory and non-enforceable, some states have set enforceable limits for PFAS.¹⁶⁰ These state mandated limits are more restrictive than the non-enforceable limits set by the EPA.¹⁶¹

While some states fight the EPA's recommendations, other states have taken matters into their own hands. For example, Michigan has assembled a PFAS Action Response Team to protect drinking water and investigate sources of PFAS contamination.¹⁶² In 2020, the Michigan Department of Environment, Great Lakes, and Energy announced it would adopt strict PFAS regulations for drinking water.¹⁶³ Earlier that year, the Michigan Attorney General, Dana Nessel, filed a lawsuit against seventeen defendants for damages resulting from PFAS contamination.¹⁶⁴ The defendants—including 3M and Dupont—were alleged to have “deliberately and intentionally concealed the dangers of PFAS.”¹⁶⁵ Additionally, the complaint alleged that the defendants “intentionally, purposefully, recklessly, and/or negligently” engaged with PFAS

158. *New PFAS Regulations by States*, APPLIED TECH. SERVS. (Oct. 6, 2022), <https://atslab.com/pfas/new-pfas-regulations-by-state/>.

159. See Drew Hutchinson, *States Sue DuPont, 3M in Search of Funds for PFAS Cleanup Costs*, BLOOMBERG L. (June 9, 2023, 11:06 AM), <https://news.bloomberglaw.com/environment-and-energy/states-sue-dupont-3m-in-search-of-funds-for-pfas-cleanup-costs>.

160. See *PFAS*, SAFER STATES, <https://www.saferstates.com/toxic-chemicals/pfas/> (last visited Nov. 6, 2023).

161. *Id.*

162. See *Executive Order No. 2019-03*, GOVERNOR GRETCHEN WHITMER (Feb. 4, 2019), <https://www.michigan.gov/whitmer/news/state-orders-and-directives/2019/02/04/executive-order-2019-3>.

163. See Press Release, Mich. Dep't of Env't, Great Lakes & Energy, Michigan Adopts Strict PFAS in Drinking Water Standards (July 22, 2020), <https://content.govdelivery.com/accounts/MIDEQ/bulletins/296ee62>.

164. See Kelly Rossman-McKinney, *Michigan Files Lawsuit Against 3M, Dupont and Others for PFAS Contamination*, MICH. DEP'T OF ATT'Y GEN. (Jan. 14, 2020), <https://www.michigan.gov/ag/news/press-releases/2020/01/14/michigan-files-lawsuit-against-3m-dupont-and-others-for-pfas-contamination>.

165. Complaint at 26, *Nessel v. 3M Co.*, No. 21-CV-205 (W.D. Mich. Mar. 1, 2021).

chemicals in a manner which the defendants knew would harm Michiganders.¹⁶⁶

Another state response involving legal action occurred in Ohio, where the Ohio Attorney General, Mike DeWine, filed a lawsuit against DuPont (fifteen years after the Dupont suit in West Virginia) alleging that the company released toxic PFAS chemicals from its plant into the Ohio River, despite their knowledge of the risks such a release posed to the citizens of Ohio.¹⁶⁷ The lawsuit sought restitution and damages for injury to Ohio's natural resources and sought to require DuPont to bear the cost of cleaning up PFOA contamination.¹⁶⁸ Discussing the suit, DeWine said, "We believe the evidence shows that DuPont kept releasing [PFOA] even though it knew about the harm it could cause."¹⁶⁹ He continued, "We believe DuPont should pay for any damage it caused, and we're taking this action to protect Ohio, its citizens, and its natural resources."¹⁷⁰

Minnesota has also taken the initiative to regulate PFAS. Minnesota is home to 3M, which has been manufacturing PFAS chemicals since the 1950s.¹⁷¹ In 2002, the Minnesota Pollution Control Agency found PFOA and PFOS near the 3M plant in Cottage Grove, Michigan.¹⁷² While the PFAS contamination originated in Cottage Grove, investigations of the East Metro Minnesota area identified groundwater contamination of over 150 square miles.¹⁷³ This area encompasses the residences of over 140,000 Minnesota citizens, all of which regularly use PFAS-contaminated drinking water.¹⁷⁴

Following this discovery, the Minnesota Pollution Control Agency requested the Minnesota Department of Health to issue new, stricter

166. *Id.* at 28.

167. See Press Release, Ohio Att'y Gen., Attorney General DeWine Files Lawsuit Against DuPont for Releasing Toxic Chemical into Ohio for Decades (Feb. 8, 2018), <https://www.ohioattorneygeneral.gov/Media/News-Releases/February-2018/Attorney-General-DeWine-Files-Lawsuit-Against-DuPo>; see also Complaint at 1, 2, *Ohio v. E.I. Du Pont de Nemours and Co.*, 180T32 (Ct. of Common Pleas, Washington Cnty., Ohio Feb. 8, 2018).

168. Press Release, Ohio Att'y Gen., *supra* note 167.

169. *Id.*

170. *Id.*

171. *3M History*, 3M, https://www.3m.com/3M/en_US/company-us/about-3m/history/ (last visited Nov. 6, 2023); *The Facts on PFAS*, 3M: PFASFACTS, <https://www.pfasfacts.com/> (last visited Nov. 6, 2023).

172. See *History of MDH Activities – Per- and Perfluoroalkyl Substances (PFAS)*, MINN. DEP'T OF HEALTH, <https://www.health.state.mn.us/communities/environment/hazardous/topics/history.html#2002> (last updated Sept. 26, 2023).

173. *Id.*

174. *Id.*

Health Based Values (similar to EPA health advisory levels) for PFOS and PFOA.¹⁷⁵ As of April 2019, the Health Based Value for PFOS was set to fifteen ppt, as opposed to the previous value of twenty-seven ppt.¹⁷⁶ Lowering the parts-per-trillion Health Based Value from twenty-seven to fifteen served as an alarm to Minnesota citizens that the previous PFOS ppt level of twenty-seven—where adverse health effects would not be expected—is no longer a safe level. Now, any ppt level higher than fifteen is considered to put humans at risk for adverse health effects. For scale, seventy parts per trillion is roughly equivalent to about seventy drops of liquid in an Olympic-sized swimming pool.¹⁷⁷

Michigan, Ohio, and Minnesota provide clear examples of how states can take hold of PFAS regulation and contamination accountability on their own soil, outside of the national regulatory framework and health advisory levels set by the EPA.

In contrast, other states—like Texas—have pushed back on the EPA’s PFAS contamination limits.¹⁷⁸ These opposing states base their pushback on findings from a small number of state-sponsored health studies that found no link between cancer and PFAS chemicals.¹⁷⁹ Other studies suggest the contamination limits proposed by the EPA are higher than needed to protect human health.¹⁸⁰

From the PFAS regulation discussion emerges a growing and more present concern for states and the federal government alike: PFAS contamination in the booming aviation and aerospace industries.

States such as Connecticut, New Mexico, Washington, and California are leading the way in terms of state legislative action concerning AFFF. Despite the states’ efforts, their respective acts have been generally thwarted by the FAA’s constructive mandate of foam that contains PFAS. California, however, has been the most successful in identifying alternative PFAS sources at airports such as personal protective equipment and requiring PFAS contamination mitigation strategies at airports.¹⁸¹

175. *Id.*

176. *Id.*

177. Conn. Dep’t of Energy & Env’t Prot. et al., *supra* note 79.

178. Matthew Thurlow, *Fear and Loathing of PFAS*, TRENDS (ABA Section of Env’t, Energy & Res.), Jan./Feb. 2019, at 7, 8.

179. *Id.*

180. *Id.*

181. See generally John Gardella, *PFAS Firefighting Foam Ban Passes in CA*, NAT’L L. REV. (Sept. 30, 2020), <https://www.natlawreview.com/article/pfas-firefighting-foam-ban-passes-ca>.

Senate Bill 837, a Connecticut bill concerning the use of perfluoroalkyl or polyfluoroalkyl substances in Class B firefighting foam, was passed in July 2021.¹⁸² The bill prohibited the use of Class B firefighting foams with intentionally added PFAS, in any amount, for training purposes.¹⁸³ Additionally, the bill established a take-back program for firefighting foams containing PFAS.¹⁸⁴ For airports using Class B foam with intentional PFAS additives, the bill authorized mitigation measures to prevent the release of this type of foam into the natural environment, “including the implementation of plans and physical features that are designed to prevent releases of such foam . . . through the use of containment, treatment, and disposal of such foam, even when such foam is deployed in its intended manner.”¹⁸⁵ Most importantly, the bill prohibited the use of a Class B PFAS-containing foam systems after October 1, 2023.¹⁸⁶

Senate Bill 837 acknowledged that there is a tension and dichotomy between the bill’s requirements and the FAA Part 139 regulations, which still require the use of AFFF that contains PFAS. Section 4 of the Act enumerates that “[n]o person required by federal law to use a class B firefighting foam that contains an intentionally added perfluoroalkyl or polyfluoroalkyl substance in any amount shall use such foam” any later than either: (1) federal law changes to “prohibit[] the use of said foam”; or (2) “one year after a change in federal law to no longer require the use of such foam.”¹⁸⁷ In effect, federal law requires most commercial airports to use Class B PFAS-containing firefighting foams. Thus, Senate Bill 837 attempts to bypass current FAA Part 139 requirements by mandating that the use of these foams is to cease one year after federal law changes, and it no longer requires the use of the foam at Connecticut civilian airports. However, even though the FAA stated fluorinated foams are no longer required as of October 24, 2021, “the existing performance standard for firefighting foam remains unchanged.”¹⁸⁸ The result? Section 4 of the bill is void because all Part 139 certified airports are required to follow the

182. *Substitute for Raised S.B. No. 837 Session Year 2021*, CONN. GEN. ASSEMBLY, https://www.cga.ct.gov/asp/cgabillstatus/cgabillstatus.asp?selBillType=Bill&bill_num=SB837&which_year=2021 (last visited Feb. 8, 2023).

183. Conn. Pub. Act No. 21-191, § 1(b)(1) (July 13, 2021), <https://www.cga.ct.gov/2021/act/Pa/pdf/2021PA-00191-R00SB-00837-PA.PDF>.

184. *Id.* § 1(c).

185. *Id.* § 1(b)(3).

186. *Id.*

187. *Id.* § 1(b)(4).

188. FAA, Part 139 CertAlert No. 21-05, *supra* note 100.

performance standards for firefighting foam, and the performance standard that constructively mandates use of firefighting foams containing PFAS remains unchanged. Connecticut has not and cannot stop its use of PFAS-containing firefighting foams without forcing its airports to violate Part 139.

Senate Bill 837 does, however, allow for a “take-back” program where “[n]ot later than October 1, 2021, the Commissioner of Energy and Environmental Protection shall develop or identify a take-back program for municipally owned [Class-B PFAS foam] that results in the application of best management practices for the disposal of such substances.”¹⁸⁹ Through this program, Connecticut attempts to mitigate the problem of long-term storage and use of AFFF that contains PFAS.

In New Mexico, the New Mexico Environment Department and the New Mexico Office of the Attorney General filed suit in 2019 against the United States Air Force to compel the military to acknowledge and address PFAS contamination at Cannon and Holloman Air Force Bases.¹⁹⁰ The complaint alleges a violation of the New Mexico Hazardous Waste Act.¹⁹¹ New Mexico asserted that the federal government has a responsibility to clean up PFAS contamination left behind by military firefighting activities that involve AFFF.¹⁹² According to the New Mexico Attorney General, Hector Balderas, “No one has a right to pollute New Mexico’s vital water resources We will fight to ensure that New Mexico families and military families have access to safe, clean water.”¹⁹³ The complaint requested immediate injunctive relief that the Air Force must clean up PFAS contamination at both the Cannon and Holloman bases because “PFAS contamination constitutes an imminent and substantial danger to communities on and off base.”¹⁹⁴ Balderas added, “In addition to violating environmental laws, the Air Force violated our

189. *See* Conn. Pub. Act No. 21-191, § 1(c).

190. *See* Complaint at 1-2, *New Mexico v. United States*, No. 6:19-cv-00178 (D.N.M. July 24, 2019).

191. *Id.* at 1.

192. Susan Montoya Bryan, *New Mexico Sues U.S. Air Force Over Groundwater Contamination at Holloman, Cannon*, LAS CRUCES SUN NEWS (Mar. 6, 2019, 7:18 AM), <https://www.lcsun-news.com/story/news/local/2019/03/05/nm-vs-us-air-force-water-case-holloman-cannon-toxic-chemicals/3070729002/>.

193. Press Release, N.M. Env’t Dep’t & N.M. Office of the Att’y Gen., *State Sues Air Force Over PFAS Contamination at Cannon, Holloman* (Mar. 5, 2019), <https://www.env.nm.gov/wp-content/uploads/2019/03/Air-Force-complaint-filed.pdf>.

194. *Id.*

public trust. Today we begin holding them accountable.”¹⁹⁵ Although still ongoing, the lawsuit represents the bold attempt by both Balderas and the New Mexico Environment Department to hold the DoD, by way of the Air Force, accountable for continuing to use toxic AFFF on their bases near populous communities.

In Washington, Senate Bill 6413 was passed into law in 2018 and addressed the use of toxic PFAS chemicals in Class B firefighting foams.¹⁹⁶ The bill, “[r]elating to reducing the use of certain toxic chemicals in firefighting activities,”¹⁹⁷ prohibits the manufacture, sale, and distribution of Class B firefighting foams in which PFAS has been intentionally added.¹⁹⁸ However, section 2 of the Act goes on to say, “The restrictions in subsection (1) of this section do not apply to any manufacture, sale, or distribution of class B firefighting foam where the inclusion of PFAS chemicals are required by federal law, including but not limited to the requirements of 14 C.F.R. 139.317”¹⁹⁹

Washington attempted to mitigate PFAS concerns with firefighting agents through this bill. However, once again, the provisions are not effective against airports—the main culprit of AFFF contamination—because the bill cannot override regulations governing FAA Part 139 certified airports. However, in 2020, Rep. Beth Doglio introduced House Bill 2265 (“eliminating exemptions from restrictions on the use of perfluoroalkyl and polyfluoroalkyl substances in firefighting foam”).²⁰⁰ House Bill 2265, enacted later that year, included language specifically addressing the predicament with Part 139 certification and firefighting agent mandates by requiring “each section 139 licensed airport [to] report . . . on the airport’s status with respect to obtaining alternative firefighting agents approved by the federal aviation administration and any necessary infrastructure.”²⁰¹ Even though the Act predicts future changes to Part 139 “[i]n the event that the requirements of 14 C.F.R. Sec. 139.317 . . . change after January 1, 2018, to allow the use” of foam without PFAS additives, the effect is still the same.²⁰² No matter what, until the FAA certifies a permissible alternative without PFAS in

195. *Id.*

196. WASH. REV. CODE § 70A.400.020 (2023).

197. S.B. 6413, 65th Leg., Reg. Sess. pmbl. (Wash. 2018).

198. WASH. REV. CODE § 70A.400.020(1).

199. *Id.* § 70A.400.020(2)(a).

200. H.B. 2265, 66th Leg., Reg. Sess. pmbl. (Wash. 2020).

201. WASH. REV. CODE § 70A.400.020(2)(b).

202. *Id.*

accordance with the DoD military specifications, Part 139 airports in Washington still must use PFAS foam despite the state's attempt to curb its use.

In California, Governor Gavin Newsom signed Senate Bill 1044 into law in 2020.²⁰³ The bill, similar to those of Washington and Connecticut, prohibits the sale and manufacture of Class B firefighting foam containing intentionally added PFAS chemicals.²⁰⁴ In alignment with the Washington and Connecticut bills, this bill provides for an exemption relating to the use of such firefighting foams that are “required by federal law, including, but not limited to, Section 139.317 of Title 14 of the Code of Federal Regulations.”²⁰⁵ Once again, despite California's efforts to curb the use of AFFF that contains PFAS, federal law stemming from the DoD and FAA block every attempt to mitigate PFAS contamination. This bill, however, attempted to ban the use of AFFF that contains PFAS only for *training* purposes starting January 1, 2022, which includes training at Part 139-certified airports.²⁰⁶

Of particular significance, California became the first state to address PFAS chemicals intentionally added to firefighting personal protective equipment (“PPE”).²⁰⁷ While California cannot ban the overall use of AFFF that contains PFAS at its Part 139-certified airports, it has the unique power to ban use of PFAS at airports in other ways through PPE used for firefighting activities. Section (b)(1) of the bill states that “any person, including a manufacturer, that sells firefighter [PPE] to any person shall provide a written notice to the purchaser . . . if the firefighter [PPE] contains intentionally added PFAS chemicals.”²⁰⁸ The bill continues on to say, “The written notice shall include a statement that the firefighter [PPE] contains PFAS chemicals and the reason that PFAS chemicals are added to the equipment.”²⁰⁹ Small steps can lead to big changes, and California is leading the way in terms of legislative mitigation of PFAS contamination—despite guardrails set by the DoD and the FAA.

203. John Gardella, *PFAS Firefighting Foam Ban Passes in CA*, NAT'L L. REV. (Sept. 30, 2020), <https://www.natlawreview.com/article/pfas-firefighting-foam-ban-passes-ca>.

204. S.B. 1044, 2020. Leg., Reg. Sess. (Cal. 2020). Senate Bill 1044 was enacted as CAL. HEALTH & SAFETY CODE ANN. § 13061 (West 2023).

205. CAL. HEALTH & SAFETY CODE ANN. § 13061(b)(2).

206. *See id.*

207. *See Gardella, supra* note 203.

208. CAL. HEALTH & SAFETY CODE ANN. § 13029(b)(1) (West 2023).

209. *Id.*

Outside of the legislative context, the Division of Drinking Water and the Division of Water Quality announced the California State Water Control Board's phased approach to investigate PFAS contamination at and around thirty-one different airports.²¹⁰ At the top of the Phase I plan is airport contamination.²¹¹ Pursuant to Phase II of the investigation plan, the State Board's orders will "require [airports] to respond to a questionnaire regarding the historical use of PFAS-containing products within 30 days, and submit work plans for conducting testing within 60 days."²¹² Furthermore, "Failure to comply [with these orders] may be punished by fines ranging from \$5,000 to \$25,000 per day per violation."²¹³ While the release of the State Water Control Board investigation plan does not explicitly call on the FAA or DoD to outright ban the use of PFAS chemicals at airports, it does signal a new regulatory regime where states are stringently investigating PFAS contamination and the release of PFAS into the environment via airports.

California, Washington, New Mexico, and Connecticut are leading the charge to enact legislation on the state level that directly addresses the unique concern of AFFF at airports. Despite their efforts, however, the FAA and DoD can wield their influence within the aviation and aerospace industries to stifle national attempts to concretely authorize, mitigate damage, and ban AFFF containing PFAS in the United States. Nevertheless, it is important to recognize the FAA and DoD's respective influences that can impact regulatory change, as has been the case with previous discoveries of innovative products.

E. Past Exceptions and Lobbyist Turmoil

Throughout history, groundbreaking inventions and products were later discovered to be harmful to the environment and human health; some were even discovered to be deadly. Products like lead paint,²¹⁴ mercury

210. *California's Phased Investigation Approach to PFAS*, BABCOCK LAB'S INC. (Apr. 30, 2019), <https://www.babcocklabs.com/news/californias-phased-investigation-approach-to-pfas/2019>.

211. Kamran Javandel et al., *State Water Board Unveils Aggressive Plan to Issue Investigative Orders for PFAS*, NAT'L L. REV. (Mar. 18, 2019), <https://www.natlawreview.com/article/state-water-board-unveils-aggressive-plan-to-issue-investigative-orders-pfas>.

212. *Id.*

213. *Id.*

214. See *Childhood Lead Poisoning Prevention: Lead in Paint*, CTRS. FOR DISEASE CONTROL & PREVENTION, <https://www.cdc.gov/nceh/lead/prevention/sources/paint.htm> (last reviewed Dec. 16, 2022).

thermometers,²¹⁵ and arsenite green dye (Scheele's Green),²¹⁶ all once widely used and prevalent in society, have been rendered obsolete due to the discovery of their toxicity and threat to human and environmental harm. However, some products, despite their now well-known toxicity, are still used today because there is no clear alternative to match their unique performance.

Asbestos, for example, which is highly toxic to those who inhales the microscopic fibers, has never been outright banned, and is still found in many American homes.²¹⁷ Asbestos was even used by NASA in 2012 as a heat insulator and placed between solid rocket booster segments used to fill the voids because it was the only material that could properly seal the space to avoid potentially explosive leaks in the fuel tank.²¹⁸ Today, the EPA has restricted asbestos to certain uses, and as of 1991, five uses of asbestos are prohibited from being manufactured, processed, imported, or distributed.²¹⁹ Asbestos, similar to PFAS chemicals, is still in use today despite its toxicity. A counterargument to the outright ban of PFAS chemicals in the aviation and aerospace industries is that their inclusion in the foam and their unique properties, like those of asbestos, are unmatched by any other product and legislation that limits use of PFAS products is sufficient to lessen harms to human health.

The FAA relies on standards set by the military, not those specific to commercial airports. The FAA's focus on mil-specs diverts its attention from the fact that international aviation standards *have* identified multiple viable foam alternatives—without PFAS chemicals that are safe for commercial airport use.²²⁰ Why else might PFAS chemicals still be so prevalent in the United States? PFAS chemicals are, after all, well-known to be toxic.

215. See *Mercury Thermometers*, U.S. ENV'T PROT. AGENCY (EPA), <https://www.epa.gov/mercury/mercury-thermometers> (last updated Oct. 25, 2023).

216. See Emma Taggart, *The History of the Color Green: From a Poisonous Pigment to a Symbol of Environmentalism*, MY MOD. MET (June 16, 2020), <https://mymodernmet.com/history-of-the-color-green/>.

217. *When Was Asbestos Banned in the U.S.?*, LUNG CANCER CTR., Lung Cancer Center, <https://www.lungcancercenter.com/lung-cancer/risk-factors/asbestos/when-was-asbestos-banned/> (last visited Nov. 7, 2023).

218. Chris Gebhardt, *ATK Making Progress on SRB Propellant Void Issue*, NASASPACEFLIGHT.COM (NSF) (Sept. 15, 2014), <https://www.nasaspaceflight.com/2014/09/atk-making-progress-srb-propellant-void-issue/>.

219. See *When Was Asbestos Banned in the U.S.*, *supra* note 217.

220. Benesh, *supra* note 8.

In addition to the FAA's focus on military standards for AFFF, part of the reason PFAS chemicals are still prevalent involves PFAS chemical manufacturers' unwillingness to release their grip on the financial gains they receive from the product's continued use.²²¹ PFAS manufacturers argue that PFAS chemicals are on par with tobacco and oil, in that society is prepared to accept negative qualities in exchange for positive economic gain.²²² One journalist described Erik Olson's²²³ view that "main tactic used by [PFAS] industry lobbyists is to employ sophisticated strategies out of the tobacco and oil lobbies' playbook."²²⁴ These strategies aim to create a "cloud of doubt" that diminishes the credibility of "clear science that demonstrates [PFAS'] health threat."²²⁵ According to Olson, "The longer [PFAS-industry lobbyists] can stretch things out, the longer they continue making money."²²⁶ PFAS manufacturers, such as Chemours, 3M, Dupont, Daikin, Arkema, Solvay, and the American Chemistry Council trade group have all sent lobbyists to Congress and made significant donations to different committee members, likely motivated by their desire to ensure they do not get stuck with the bill for PFAS cleanup and liabilities.²²⁷

For example, rules proposed by the EPA and Congress, such as the PFAS Action Plan of 2019 and the amendment to the National Defense Authorization Act of 2020 could have made PFAS manufacturers liable for contamination and required them to pay the cleanup costs.²²⁸ As of November 2023, neither the PFAS Action Plan of 2019 nor the NDAA amendment have passed.²²⁹

Because the PFAS chemical industry is so concerned with the significant financial losses and the responsibility it could bear if PFAS chemicals are regulated or even banned in the United States, it is unlikely there will be a sweeping denunciation or similar fate for PFAS that lead paint, mercury thermometers, or arsenite dye had in the United States anytime soon.

221. Tom Perkins, *How US Chemical Industry Lobbying and Cash Defeated Regulation in Trump Era*, GUARDIAN (Apr. 26, 2021, 6:00 AM), <https://www.theguardian.com/environment/2021/apr/26/us-chemical-companies-lobbying-donation-defeated-regulation>.

222. *See id.*

223. Erik Olson is a lobbyist with the Natural Resources Defense Council.

224. Perkins, *supra* note 221 (paraphrasing Olson).

225. *Id.*

226. *Id.*

227. *See id.*

228. *Id.*

229. *See id.*

IV. The FAA and DoD Must Ban AFFF Containing PFAS

Even with such powerful opposition and despite the FAA's report that no viable AFFF alternatives meet the strict DoD performance specifications, "[v]iable alternatives to AFFF are already on the market [that] meet international aviation standards used by airports all over the world."²³⁰ The FAA must adapt and balance the competing interests of airfield safety and environmental and human health protection through outright banning the use of AFFF at airports and certifying a viable alternative that does not contain PFAS and is already acceptable by international aviation standards.

Congressman Dan Kildee, co-chair of the bipartisan Congressional PFAS Task Force, and Senator Kirsten Gillibrand sent a letter to the FAA administrator, Stephen Dickson, following the passing of the October 4, 2021, deadline to authorize a PFAS-free foam alternative.²³¹ Their letter sums up the message Congress intended the FAA to hear:

[B]ecause the FAA has not authorized the use of any alternative PFAS-free foams . . . or updated the current military performance standard requirement, airports are not allowed or in a position to make the switch at this time. Additionally, the only way for airports to comply with the current performance standards is by using foams containing PFAS.²³²

Regulatory flexibility was not the goal of section 332 of the 2018 FAA Reauthorization Act. Congress intended the bill to direct the FAA, by proxy of the mil-specs, to take charge of the aviation-centered PFAS problem and quickly phase out the use of AFFF at airports.²³³

If it was not clear enough, members of Congress have explicitly signaled their intentions to the FAA. In the same letter to the FAA Administrator, twenty Senators and thirty-six Representatives joined Kildee and Gillibrand to write, "To clarify, Congress' original intent of Section 332 of the Federal Aviation Administration Reauthorization Act

230. Benesh, *supra* note 8.

231. Press Release, Dan Kildee, Kildee, Gillibrand Urge FAA to Allow PFAS-Free Firefighting Foam at Airports (Nov. 9, 2021), <https://dankildee.house.gov/media/press-releases/kildee-gillibrand-urge-faa-allow-pfas-free-firefighting-foam-airports>.

232. *Id.* (quoting Letter from Kirsten Gillibrand and Daniel Kildee, United States Senator and Member of Congress, to Stephen Dickson, Administrator of the Fed. Aviation Admin. (Nov. 8, 2021), <https://pappas.house.gov/sites/evo-subsites/pappas-evo.house.gov/files/Gillibrand-Kildee%20FAA%20PFAS%20Sign%20On%20Letter.pdf>).

233. *See id.*

of 2018 . . . was to trigger actions by the [FAA] so airports would have the option to begin using PFAS-free firefighting foam by October 4, 2021.”²³⁴ Even after the publication of the May 2023 Foam Transition plan, airports are given the choice to follow MIL-SPEC F3.²³⁵ The FAA clearly states, “Airports will need to decide whether to transition to MILSPEC F3 or to continue using AFFF as a firefighting extinguishing agent in the immediate future.”²³⁶

F3, however, is not technically PFAS-free.²³⁷ The new military specifications for F3 include a *limitation* on PFAS content that cannot exceed one part per billion.²³⁸ One part per billion is notably much higher than the current proposed limits for PFAS in drinking water.²³⁹ Thus, non-zero levels of PFAS are still able to enter into the environment and drinking water. Congress intended to entirely phase out the use of foams containing PFAS.²⁴⁰ By contrast, F3’s mil-spec set “tight limits of PFAS occurrence” and focuses on “acute toxicity rather than chronic toxicity, notably not “evaluat[ing] the fate and impact of discharge into water sources.”²⁴¹ Offering an alternative that still has the potential to introduce PFAS contamination in and around airports is not the answer. International PFAS standards, however, offer clearer guidance.

A. International AFFF PFAS Standards Are Viable for the United States Airport Use

Contrary to the aviation standards of the United States, international standards do not constructively mandate the use of firefighting foam with PFAS chemicals at airports, and alternative foams without PFAS have been on the international market for over twenty years.²⁴² The

234. *Id.*; Letter from Kirsten Gillibrand and Daniel Kildee, United States Senator and Member of Congress, to Stephen Dickson, Administrator of the Fed. Aviation Admin., *supra* note 232.

235. FED. AVIATION ADMIN., *supra* note 94.

236. *Id.*

237. U.S. Dep’t of Def., MIL-PRF-32725, *supra* note 88.

238. F3 Military Specification FAQs, *supra* note 86.

239. *Per- and Polyfluoroalkyl Substances (PFAS): Proposed PFAS National Primary Drinking Water Regulation*, U.S. ENV’T PROT. AGENCY (EPA), <https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas> (last updated Sept. 22, 2023) (showing that one part per billion is greater than the proposed drinking water limits of four parts per trillion—roughly equal to 4,000 parts per trillion).

240. Press Release, Dan Kildee, *supra* note 231.

241. Mohamed Ateia et al., *Sunrise of PFAS Replacements: A Perspective on Fluorine-Free Foams*, 11 ACS SUSTAINABLE CHEM. ENG. 7986, 7990 (2023).

242. See Benesh, *supra* note 8.

International Civil Aviation Organization (“ICAO”) develops and implements global aviation standards and practices.²⁴³ The ICAO is an aviation technical body of the United Nations, of which the United States is a founding member.²⁴⁴ While the FAA is the aviation regulator of the United States, they look to the ICAO for best practices and guidance from the international community regarding new regulations.²⁴⁵ However, the FAA is not bound to the guidance and standards the ICAO sets.²⁴⁶

Among the international standards set by the ICAO are environmental standards relating to PFAS chemicals in firefighting foams. ICAO Level B represents an international firefighting foam standard used by airports all over the world, and it does not require PFAS chemicals.²⁴⁷ The fire size and rate of extinguishment specifications of ICAO Level B represent those most common to civilian airports with large commercial services, similar to Part 139-certified U.S. airports.²⁴⁸ Major international airports, such as London Heathrow, Gatwick, Oslo, Stockholm, Paris Charles De Gaulle, Paris Orly, and Dubai, do not require AFFF because they follow ICAO international standards of Level B for firefighting foams.²⁴⁹ London Heathrow, which currently uses a fluorine-free firefighting foam, has proven the alternative foam’s effectiveness with a 2013 real-life emergency engine fire on a British Airways plane.²⁵⁰ No U.S. airports follow the ICAO Level B international standard for firefighting foam because they are subject to the regulations of the FAA and DoD.

Other U.S.-based groups emphasize the viability of PFAS-free foams as effective. The International Pollutants Elimination Network has identified that “[t]he current generation of fluorine-free firefighting foams (F3) are viable alternatives to aqueous film-forming foams (AFFF, FFFP, FP)” and that “[a]ny operational differences between [PFAS-containing]

243. *ICAO and International Training*, FAA, https://www.faa.gov/about/office_org/headquarters_offices/apl/international_affairs/global_issues (last updated Feb. 15, 2023).

244. *Id.*

245. Matt Claiborne, *What Is the ICAO, and What Do They Do?*, AEROCORNER, <https://aerocorner.com/blog/icao/> (last visited Nov. 7, 2023).

246. *See id.*

247. *See* Benesh, *supra* note 8.

248. *See* Mike Wilson, *ARFF and Recovery: Focusing on the Best Fire Protection*, INT’L AIRPORT REV. (Nov. 27, 2018), <https://www.internationalairportreview.com/article/79314/focusing-on-the-best-fire-protection/>.

249. *See* Benesh, *supra* note 8; *see also* Press Release, Dan Kildee, *supra* note 231.

250. *See* Alastair Jamieson, *Delays After Passenger Jet Lands at Heathrow with Engine Fire*, NBC NEWS (May 24, 2013, 3:30 AM), <https://www.nbcnews.com/news/world/delays-after-passenger-jet-lands-heathrow-engine-fire-flna6C10060391>.

and [non-PFAS-containing] foams can now either be engineered out or dealt with by appropriate training.”²⁵¹ Even in the United States, the New York State Pollution Prevention Institute has identified nearly 100 fluorine-free firefighting foams.²⁵² Fluorine-free, however, does not mean PFAS-free.²⁵³ Unlike the United States, multiple international PFAS standards have identified this distinction and outright banned PFAS from firefighting foam altogether.

B. International PFAS Regulation in Action

Besides following the ICAO Level B international standards, Australia has taken an additional step in regulating PFAS chemicals.²⁵⁴ The Australian state of South Australia became the first government body in the world to outright ban firefighting foams containing PFAS in 2018.²⁵⁵ With the ban, the government allotted a two-year grace period to “help industry meet the requirements of the ban.”²⁵⁶ Queensland has also banned PFAS foams, with exceptions.²⁵⁷

Further, Canada has elected to transition to fluorine-free firefighting foams at its airports.²⁵⁸ In 2019, Transport Canada announced an exemption from the Aircraft Fire Fighting at Airport and Aerodromes Standards for Canadian airport operators (like C.F.R. Part 139 for U.S. airport operators).²⁵⁹ The exemption “allow[s] Canadian airport operators to elect to transition to a fluorine-free foam which is more

251. T. BLUTEAU ET AL., INT’L POLLUTANTS ELIMINATION NETWORK (IPEN) EXPERT PANEL, THE GLOBAL PFAS PROBLEM: FLUORINE-FREE ALTERNATIVES AS SOLUTIONS 2 (2019), https://ipen.org/sites/default/files/documents/global_pfas_exec-sum_en.pdf.

252. N.Y. STATE POLLUTION PREVENTION INST., ROCHESTER INST. OF TECH., PER- AND POLYFLUORINATED SUBSTANCES IN FIREFIGHTING FOAM (2018), <https://cswab.org/wp-content/uploads/2019/03/PFAS-in-Firefighting-Foam-New-York-State-Pollution-Prevention-Institute-Dec-2018.pdf>.

253. U.S. Dep’t of Def., MIL-PRF-32725, *supra* note 88.

254. *See* Benesh, *supra* note 8.

255. *Id.*

256. *Per- and Poly-Fluorinated Substances (PFAS)*, S. AUSTL. ENV’T PROT. AUTH. (EPA), https://www.epa.sa.gov.au/environmental_info/perfluorinated-compounds (last updated Aug. 8, 2023).

257. Benesh, *supra* note 8.

258. *Exemption from Paragraph 323.08(1)(a) of the Aircraft Fire Fighting at Airport and Aerodromes Standards Made Pursuant to Section 303.08 of the Canadian Aviation Regulations*, TRANSP. CAN., <https://www.tc.gc.ca/CivilAviation/Regserv/Affairs/exemptions/docs/en/3210.htm> (last modified July 3, 2019).

259. *Id.*

environmentally friendly and which is currently available on the market and used in other countries.”²⁶⁰

The exemption directs Canadian airport operators to “select a fluorine-free foam with a low environmental impact (i.e. persistency, toxicity and bioaccumulative) that does not contain *any* fluorinated compounds such as fluorine, per- and polyfluoroalkyl substances (PFAS) or other groups of fluorinated substances.”²⁶¹ By way of this exemption, Canadian airports can act on their own accord and select a PFAS-free firefighting foam to be used at their airfields.

Glaringly absent from U.S. airport-certification regulations is any free choice in foam selection. The Canadian government’s decision to create this exemption mirrors that of the congressional intent in section 332 of the 2018 FAA Reauthorization Act—to direct the FAA to permit airports to use an AFFF alternative at Part 139-certified airports in the United States.

The FAA should adopt international aviation standards for firefighting foam because ICAO Level B firefighting-foam standards permit the use of non-PFAS foams and are successfully used at the world’s largest and most popular foreign international airports.

C. Continuing the Use of AFFF Leads to Potential Airport Liability

Airports are not required by law to investigate PFAS contamination; however, they may still be held liable for PFAS contamination despite FAA mandates to continue its use.²⁶² Justin Barkowski, vice president of regulatory affairs at the American Association of Airport Executives, said this predicament “raises some complex legal questions.”²⁶³

As the regulatory framework for PFAS-chemical contamination evolves, so do the legal claims that involve the contamination. Because PFAS chemicals like PFOS and PFOA have not yet been classified as hazardous substances under CERCLA or the state equivalents, people and entities impacted by PFAS contamination must resort to common law toxic-tort claims, including trespass, negligence, and nuisance.²⁶⁴

260. *Id.*

261. *Id.* (emphasis added).

262. Morrison, *supra* note 1.

263. *Id.*

264. Steven Siros, *Airport Property Due Diligence Should Cover PFAS Pollution*, LAW 360 (July 22, 2019, 3:28 PM), <https://www.jenner.com/a/web/eDVDkAeuiX8phRDRNqPTHv/4HRMZQ/Siros%2520Law360%2520July%252022%25202019.pdf?1563900315>.

Under tort law, a party can be found negligent even though they follow the law.²⁶⁵ Returning to the case of the Allegheny County Airport Authority, discussed in the Introduction, airport records and internal emails evidence that the Authority has been aware of the risks that PFAS contamination poses to the surrounding area for years.²⁶⁶

Mark Cucker, an experienced PFAS lawyer in Philadelphia, noted that the tort-law standard for negligence is reasonable care, not just following the black letter law.²⁶⁷ Cucker opined that airports and airport authorities, like Allegheny County Airport Authority, likely cannot use their adherence to FAA regulations as a defense to a negligence claim for PFAS contamination because a court would likely find it unreasonable for airports to do nothing when they know of a serious problem.²⁶⁸ Airports and their authorities risk being sued by anyone who lives near the airport property and is injured or develops a disease associated with PFAS contamination.²⁶⁹ Steven Siros, a New York lawyer, wrote, “Although each factual situation is different, due to the persistent nature of these chemicals in the environment, sticking one’s head in the sand and hoping these PFAS compounds will degrade over time is probably not an effective strategy.”²⁷⁰

For example, in 2018, a multidistrict litigation suit involving AFFF that contains PFAS was consolidated in the District of South Carolina.²⁷¹ The suit has over 2,500 cases involving allegations of PFAS pollution or exposure to PFAS chemicals from AFFF that contains PFAS.²⁷² The plaintiffs, including states, water providers, airports, and individuals, assigned liability for PFAS contamination to various PFAS manufacturers, AFFF manufacturers, and suppliers, while the plaintiffs demanded remediation costs.²⁷³

265. See Morrison, *supra* note 1.

266. *Id.*

267. *Id.*

268. *Id.*

269. *Id.*

270. Siros, *supra* note 264.

271. *Introduction: Aqueous Film-Forming Foams (AFFF) Products Liability Litigation: MDL No. 2873*, U.S. DIST. CT.: DIST. S.C., <https://www.scd.uscourts.gov/mdl-2873/index.asp> (last visited Nov. 7, 2023).

272. John Gardella, *MDL for PFAS AFFF Sees Long-Awaited Government Contractor Ruling*, NAT’L L. REV. (Sept. 19, 2022), <https://www.natlawreview.com/article/mdl-pfas-fff-sees-long-awaited-government-contractor-ruling>.

273. *Id.*

The defendants initially asserted the government contractor defense, which would have absolved them of legal liability for several claims on the docket.²⁷⁴ This defense, established by the United States Supreme Court in *Boyle v. United Technologies Corp.*, sets forth factors where the federal government's sovereign immunity²⁷⁵ applies to government contractors who manufacture products for government use.²⁷⁶

The government contractor defense applies when “(1) the United States approved reasonably precise specifications; (2) the equipment conformed to those specifications; and (3) the supplier warned the United States about the dangers in the use of the equipment that were known to the supplier but not to the United States.”²⁷⁷ Contrary to the defense, the Court found as a matter of law the AFFF mil-spec was not a reasonably precise specification because the mil-spec did not sufficiently specify the particular types or subclasses of PFAS chemicals.²⁷⁸

Judge Gergel paid special attention to the level of knowledge each party involved had about the hazards AFFF posed and whether the parties had a free exchange of information so the government could make informed decisions about the dangers of AFFF that contains PFAS.²⁷⁹ The defendants also argued that they warned the government of PFAS-product

274. *Id.*

275. Various types of ownership exist for public-use airports. Sponsors, such as states, counties, municipalities, private owners, airport authorities, and even governmental agencies may sponsor airports. *Airport Governance Structures and Their Impact on Financial Strategies*, TRANSP. RSCH. BD., <https://crp.trb.org/acrpwebresource1/airport-governance-structures-and-their-impact-on-financial-strategies/> (last visited Nov. 7, 2023). Most U.S. airports are operated as not-for-profit entities in which the Airport Sponsor who accepts Federal airport grants are bound by the assurances and conditions in the grant agreements proffered by the FAA. *Id.*; see also *Overview: What Is AIP & What Is Eligible*, FAA, <https://www.faa.gov/airports/aip/overview> (last updated Aug. 2, 2022). By proxy of the Airport Sponsor, the Airport Manager is responsible for keeping airport premises safe. *Who Is Responsible If You Are Injured at the Airport?*, BLUMENSHINE L. GRP., <https://blumenshinelawgroup.com/airport-liability-for-unsafe-maintenance/> (last visited Nov. 7, 2023). The Airport Manager is generally not considered to be a governmental official, so they are not protected by qualified immunity. See generally *Who Is Responsible If You Are Injured at the Airport?*, *supra*; see also *Airport Governance Structures and Their Impact on Financial Strategies*, *supra*.

276. Joyce E. Kung & Elizabeth Knauer, *PFAS Litigation Update: Court Denies Summary Judgment to AFFF Manufacturers*, SIVE, PAGET & RIESE (Oct. 7, 2022), <https://sprlaw.com/pfas-litigation-update-court-denies-summary-judgment-to-afff-manufacturers/>.

277. See *Boyle v. United Technologies Corp.*, 487 U.S. 500, 512 (1988).

278. Kung & Knauer, *supra* note 276.

279. Gardella, *supra* note 272.

hazards.²⁸⁰ From this ruling that generally releases the government from liability, it is unlikely any airport commission will be able to place blame on the FAA for claims against the airport in the multidistrict litigation.

In addition to the multidistrict litigation in the District of South Carolina, the Martha's Vineyard Airport Commission in Massachusetts provides an excellent example for airports around the United States who wish to proactively mitigate PFAS contamination. The Martha's Vineyard Airport Commission proactively gave a public presentation in 2018 to elaborate on its launch of an investigation into PFAS contamination at and around the airport.²⁸¹ Later that year, the airport began testing the drinking water of the residents surrounding the airport.²⁸² Ann Richart, a former director of Martha's Vineyard Airport, said the Commission "went out on a limb" when it asked the FAA if PFAS testing of airport property would be an appropriate use of airport revenue.²⁸³ While the FAA authorized this use of revenue, Richart said, "[a]irports are starting to understand they are in a real bind between trying to professionally manage their airport and budget and also doing the right thing," because the FAA normally provides around ninety percent of an airport's improvement funding.²⁸⁴

As previously mentioned, notably absent in the FAA airport improvement program is specific allocation of funds for PFAS testing and remediation.²⁸⁵ Martha's Vineyard Airport Commission is doing the right thing and managing the risks and potential liabilities of PFAS contamination through administering their own PFAS research, remediation, and reaching the general public with the information they collect. Despite the temptation to overlook the problem of PFAS contamination that originates from its airport, in part due to the lack of direction from the FAA, Martha's Vineyard is going above and beyond to keep its local communities safe by sacrificing its own revenue to provide PFAS remediation and clean water.

V. Recommendations and Future Implications for PFAS in Aviation

The use of PFAS chemicals in the United States' aviation and aerospace industries will inevitably continue unless the FAA

280. *Id.*

281. Morrison, *supra* note 1.

282. *Id.*

283. *Id.*

284. *Id.*

285. *See id.*

comprehensively bans the use of these chemicals at Part 139 airports and spaceports. Additionally, despite instances where toxic materials and products have been phased out of use, like PFOS, PFAS-chemical manufacturers may pose a significant roadblock in implementing PFAS-chemical regulations, outside of the FAA's control.

The FAA has largely focused on standards set for the military and activities that occur on military bases, ships, submarines, and aircraft carriers rather than those specifically tailored to airport fires at commercial airports. The FAA must work with the DoD to protect human and environmental health by outright banning AFFF and certifying a viable PFAS-free foam alternative, like those used across the globe. In doing so, the DoD should immediately authorize a PFAS-free alternative firefighting foam so the FAA can: (1) ban the storage and discharge of the chemicals on airport premises, and (2) comprehensively address cleanup sites while notifying affected individuals and airport-area residents who regularly access contaminated drinking water.

Without the support and authorization from the DoD, the FAA will not likely be willing or able to amend Part 139 to affirmatively certify a PFAS-free firefighting foam alternative and ban the use of AFFF. Despite this conundrum, the FAA should work with the DoD to authorize a PFAS-free foam to act consistently with Congress's goal of the FAA Reauthorization Act of 2018, allowing allow airports to use firefighting foams that do not contain PFAS chemicals. The FAA should specifically invest their time and money into drafting new legislation to add to their next Reauthorization Act in 2028.

As the FAA, DoD, and Congress continue the legislative debate concerning the use of PFAS chemicals through AFFF at airports, Part 139-certified airports are facing liability for PFAS contamination in their surrounding area watersheds. Part 139-certified airports must be able to go on the defensive to protect their interests and mitigate the impacts of multi-district litigation suits brought against them by citizens affected by PFAS in the groundwater surrounding the airports. In the meantime, airports and state legislatures should not deviate from applying pressure to the FAA to provide funding for PFAS cleanup and standards for doing so.

VI. Conclusion

Because the FAA has not certified a foam alternative for AFFF that contains PFAS, no Part 139-certified airport in the United States can use a viable foam alternative sans PFAS without violating the law. International aviation standards concretely show that airports and aerospace facilities

can effectively use PFAS-free firefighting foam and that the need for PFAS in these specialized foams has been eliminated. Not only are there viable alternatives on the market, but the United States must put the health of thousands, if not millions, of people above the financial concerns of the manufacturers which caused the harm in the first place. The FAA and DoD have the capability to compromise and identify a foam alternative—perhaps one already in use internationally—that will keep firefighters, airport consumers, and the general public safe from harm.

The FAA cannot fulfill its mission to “Provid[e] the Safest, Most Efficient Aerospace System in the World”²⁸⁶ if PFAS chemical use remains mandated. More than anything, this Comment urges the FAA and DoD to address the unique and pressing concerns PFAS chemicals create in the aviation and aerospace industry and ban its use altogether. If the FAA does not quickly respond to this issue with comprehensive legislation changes in its upcoming FAA Reauthorization Act of 2023, PFAS will continue to not only be a “forever chemical,” but it will forever be mandated in the United States aviation and aerospace industries.

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286. *See generally* FAA, <https://www.faa.gov/node/71> (last visited Nov. 7, 2023).