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AFFF at Commercial Airports – the Blessings and the Curse of PFAS

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Unintended consequences are outcomes that are not foreseen or planned by actions or decisions, and they are often associated with government regulations. So, when the federal government required that commercial airports train with, calibrate equipment with, and use the best performing aqueous film-forming foam fire (AFFF) suppression systems to protect the safety of passengers, crew and others in the case of petroleum-based fires at airports, little did anyone predict that components in the AFFF would ultimately present threats to human health and the environment. In fact, the key constituents that help make AFFF so effective at fighting fires – surfactant compounds from a class of chemicals referred to as perfluoroalkyl and polyfluoroalkyl substance (PFASs) – have recently been associated with considerable adverse health effects, including cancer.

In order to fully grasp the nature of the growing concern relating to PFAS at airports, one needs to understand that such compounds are pervasive through our economy/environment (not just in AFFF at airports). That research is still catching up to these “emerging contaminants.” Airports now may have significant liability merely by having followed the rules in providing a level of public safety in case of an emergency.

Background of PFAS Compounds

PFAS represents thousands of man-made compounds that have been manufactured since about the 1940s. Most human health assessments that associate two PFAS compounds – perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) – with human health effects have only reached those conclusions in the past decade.[1] By 2015, PFOA- and PFOS-related products had been fully "phased out" through an agreement between manufacturers and the federal government.[2]

In addition to AFFF, PFAS compounds have been used in other consumer products, such as treatments for waterproof clothes and shoes, nonstick cookware, paint, and even food packaging. They have also been used in industrial settings, such as fume and mist suppressants for metal and plastic plating and finishing operations. This widespread use and related waste disposal has led these compounds to become pervasive in the environment, and in certain circumstances in significant quantities in groundwater, drinking water, and surface water (e.g., streams, rivers, etc.). As a result, PFAS levels in human blood on average range from about two to ten parts per trillion (PPT).

Because PFAS is still just considered an "emerging contaminant," there are few regulations related to human exposure. The main identified ingestion pathways are associated with people drinking PFAS-contaminated water or eating fish and other foods that have "bioaccumulated" PFAS from streams, rivers or water used to irrigate crops.

Federal Regulations – Currently and Coming in 2019

The EPA has published a lifetime health advisory guideline of 70 parts per trillion, which applies only to the total amount of PFOA and PFOS in drinking water. The EPA has not yet established any enforceable regulatory criteria or released health advisories for the wider family of PFAS compounds, nor has it designated any PFAS compounds as "hazardous substances" (under Superfund) or as "hazardous wastes" (under the Resource Conversation Recovery Act (RCRA)).

In the absence of federal regulation, some states have issued enforceable cleanup criteria for certain pathways and for other PFAS compounds, and some states have issued fish advisories as well. One state even issued a "do not eat" advisory for deer in an area where there is PFAS contamination in surface and groundwater.

The EPA has announced that it will release a national PFAS Management Plan in early 2019 to provide its roadmap for future PFAS regulations.

Application to the Aviation Industry

Certified commercial airports must provide aircraft rescue and firefighting (ARFF) services during air carrier operations. ARFF personnel must train with AFFF, either at the airport or at an off-site training facility. Even today, many airports conduct training on airport property. In addition, all AFFF-related equipment must be calibrated to ensure it generates proper mixtures of AFFF and water to generate foam that will extinguish a petroleum fire quickly and prevent it from reigniting. At present, the only AFFF that is approved by the FAA contains PFAS.

Additionally, many commercial airports share facilities with the U.S. military or are located at former military installations. The Department of Defense is investigating past PFAS contamination and has identified over 400 military sites with significant legacy PFAS concerns, many of them either at air bases or airports. Airport tenants with their own hangers also are likely to have automated fire suppression systems within their hangers that contain PFAS-based AFFF.

One of the beneficial characteristics of PFAS in AFFF is its resilience to heat, pressure, or oxidation. But that resilience also means that past firefighting, training, equipment maintenance and storage practices likely have left behind years of built up legacy contamination. Soils may be heavily contaminated at old firefighting training sites, and that contamination may have migrated to groundwater and areas beyond the site's perimeter. Contamination may have spread during interim construction projects that move soil around and may affect the future cost and complexity of airport development projects. Decontamination of fire trucks and hangar suppression systems requires aggressive measures to get concentrations in rinse water below advisory levels. While current AFFF formulations do not contain longer-chain PFAS (i.e., PFOA or PFOS), many of those older formulations still exist because they have long shelf-lives and were purchased before those compounds were phased out. Current AFFF formulations now contain shorter-chain PFAS, which are thought to present less human health or environmental risk, but not all have been fully tested/assessed.

As information on possible PFAS contamination is becoming more widely-known, several commercial airports have detected some level of PFAS contamination on site, with public scrutiny and allegations of connections to contaminated groundwater adjacent to or nearby their facilities. Media reports about possible or theoretical contamination linkages have increased exponentially during the course of 2018. In our experience, responding to allegations requires a site-specific strategy involving legal, technical, and community affairs experts. Investigations are complicated by the many technical challenges of collecting samples, having them analyzed at laboratories that have demonstrated such capabilities, and preparing for possible "worst case" scenarios.

Legal issues can be characterized by considering three complex and overlapping layers:

1. engaging with federal, state and local regulatory authorities;

2. ensuring appropriate use of various legal privileges in developing and executing a strategic investigation;

3. always considering the vastness of common law (among other) liabilities and defenses and the availability to recover under insurance policies.

These issues are evolving everyday as the federal/state governments and the courts continue to evaluate how best to respond to PFAS impacts in the environment.

1See Birnbaum (NIH) testimony before Senate HSGA Committee (Sept. 26, 2018)

2See https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/fact-sheet-20102015-pfoa-

stewardship-program

3See https://www.atsdr.cdc.gov/pfas/docs/pfas_clinician_fact_sheet_508.pdf

If you are wondering, one part per trillion is about six inches between the Earth and the Sun (93 million miles away).