

CLEAN AIR AGENCY RESOURCES

PFAS

What are PFAS?

Perfluoroalkyls and Polyfluoroalkyls (PFAS) are a group of human-made chemicals that were created for a variety of household and industrial uses. Some of the more commonly known PFAS are perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA), and attention has been drawn recently to GenX, a trade name for a product developed by DuPont/Chemours. PFAS have been used in protective coatings for many products including food packaging, nonstick cookware, carpets, furniture upholstery, mattresses and clothing, and have also been used in firefighting foams and chrome plating. Facilities that produce these materials, incinerators, or waste-to-energy facilities that burn the finished products may all be sources.

What happens to PFAS when they enter the environment?

PFAS are persistent chemicals that are not easily broken down in the environment and have been measured in groundwater. Some PFAS can bioaccumulate.

How can PFAS affect health?

Health effects from exposure to low levels of PFAS are not well known, but may include elevated cholesterol levels, impaired thyroid function, preeclampsia, decreased fertility, and potential adverse effects to the immune system and the developing fetus and child. Animals exposed to

high doses of some PFAS have shown changes in the liver, thyroid, and pancreatic function. While some studies have found cancer risks, others were inconclusive.

What recommendations has the federal government made?

In 2016, the EPA developed a lifetime health advisory of 70 parts per trillion (ppt, also ng/L) combined PFOS and PFOA for drinking water. This level is not enforceable.

Is this an air emissions issue?

Two concerns about PFAS bring it to the attention of air pollution agencies: the possibility of inhalation exposure; and the possibility that it can be transported for short or long ranges and deposited elsewhere, where exposure may occur.

Information on inhalation risk may be out of date as many studies have (as of July 2018) not been updated since the 1990s. If state and local agencies adopt their own standards for air they may vary widely, being based either on these studies or on emissions limits as a pollutant.

How is PFAS regulated as an air pollutant?

There are no federal regulations or standards in place for the emissions of PFAS as an air pollutant. A number of states are exploring the issue and some, including New York and New Hampshire, have issued regulations. One question is: what is the best way to classify PFAS in

order for air agencies to effectively regulate it? Although concerns relate to its toxicity, it has not been included as a listed Hazardous Air Pollutant (HAP), and no maximum achievable control technology (MACT) has been set for sources to comply with. Longer chain PFAS like PFOS and PFOA are reactive and are volatile organic compounds (VOCs) but shorter chain compounds like GenX do not fit this description. For monitoring purposes, it may be effective to treat them as particulates.

How is monitoring & modeling for PFAS done?

Monitoring is generally performed on drinking water, where ingestion concerns are greatest. While there is no air monitoring method currently approved and in use in the US, ambient particulate methods are under development by Environment Canada and early stages for methods for stack testing are underway in the US.

Modeling has been performed for actual air emissions of PFAS, but this modeling has only been verified for deposition location, and not for deposition quantity.

Where can I learn more?

Links to additional in-depth resources are available at NACAA's website, www.4cleanair.org/pfas, will be updated over time.