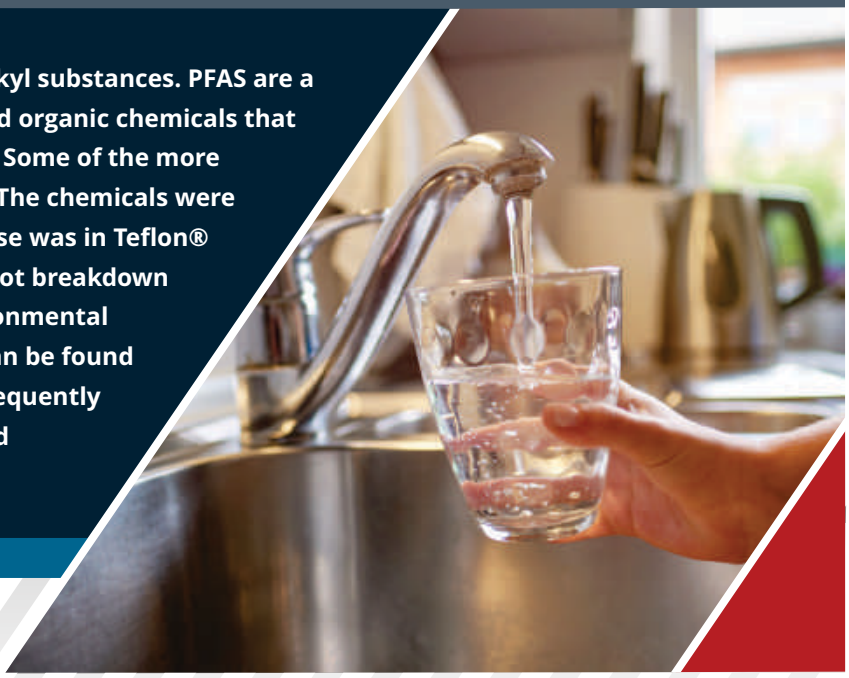
WHAT ARE PFAS?

T&M CAN HELP YOU

T&M Associates... Engineers & Enviromental Consultants

The acronym, PFAS, stands for poly- and perfluoroalkyl substances. PFAS are a complex group of nearly 4,000 man-made fluorinated organic chemicals that have been used in industry and consumer products. Some of the more common PFAS chemicals are PFOS, PFOA and PFNA. The chemicals were first synthesized in the 1930s and their first major use was in Teflon® cookware. PFAS are "forever" chemicals which will not breakdown in the environment. Due to extensive use and environmental stability, PFAS contamination is widespread. PFAS can be found in blood samples from virtually all humans and is frequently detected in groundwater, surface water systems and drinking water supplies.



HISTORICAL USES OF PFAS CHEMICALS

Industry / Product	Examples
Textiles and Leather	Water, oil and stain repellents (Scotchgard™, Stainmaster®, Gore-Tex™)
Paper Products	Coating to repel grease and moisture in food packaging, cardboard, carbonless forms, masking papers (popcorn bags, pizza boxes)
Metal Plating and Etching	Corrosion prevention, mechanical wear reduction, fume suppressant
Wire Manufacturing	Coating and insulation
Industrial Surfactants, Resins, Molds, Plastics	High-performance plastics, tubing, mold-release coatings, composite resins
Photolithography	Anti-reflective coatings, etchants, wetting agents
Class B Film-Forming Foams	Aqueous film-forming foam (AFFF) in use since 1960s for fighting flammable-liquid fires
Consumer Products	Cookware, sunscreens, car wax, cosmetics, hand creams, toothpaste, dental floss

COMMON SOURCE AREAS

Most likely, every New Jersey municipality has a source of PFAS within the community. These sources are important to identify and evaluate, to protect the community from potential exposure. Some of the most common sources of PFAS include:

- Industrial/manufacturing sites and surrounding areas
- Sites of major fires where AFFF was used
- Fire-training facilities (AFFF)
- Airports, petroleum refineries, chemical manufacturing sites, fire stations (AFFF)
- Military sites (mostly AFFF)
- Drinking water supply (especially groundwater)
- Wastewater treatment plant effluent and biosolids; land where biosolids from wastewater treatment were placed
- Landfills (leachate, air emissions, biosolid cover material)

PFAS ARE ASSOCIATED WITH:

– Liver and thyroid disease;
– Testicular and kidney cancer;
– Reproductive and developmental toxicity;
– Suppression of the immune system; and/or,
– Ulcerative colitis.

T&M CAN HELP

T&M is skilled in all PFAS needs. We are able to provide advice and assistance with the following:

- Sampling Programs
- Wellhead Protection
- Groundwater Modeling
- Industrial Pretreatment Programs
- Treatment-Technology Evaluation
- PFAS-Source Identification
- Investigation and Remediation
- Funding-Source Evaluation
- Grant / Loan Applications
- Long-term Planning
- Litigation Support
- Community Relations

Since PFAS is so prevalent, it is important for the owner of any of the common source areas listed above, or a governing body, to evaluate these areas through literature reviews and potential sampling. T&M can assist and provide recommendations regarding the appropriate steps to take.

NJ DRINKING WATER STANDARDS

In 2018, New Jersey became the first state to establish an enforceable drinking water regulatory limit for a specific PFAS chemical (PFNA). In addition, on June 1, 2020, the New Jersey Department of Environmental Protection (NJDEP) officially published its adoption of enforceable maximum contaminant levels (MCLs) for two other specific PFAS chemicals (PFOA & PFOS).

– PFNA & PFOS: Enforceable MCL of 13 ng/L or parts per trillion (ppt)
– PFOS: Enforceable MCL of 14 ng/L or ppt

Quarterly monitoring of public water systems has begun for PFNA. Monitoring by all community and non-transient non-community water systems to start in 1st quarter of 2021 for PFOA & PFOS. PFAS compounds will be added to the NJ Private Well Testing Act.

NJDEP Ground Water Quality Standards (GWQS) are the same as drinking water standards. There are no NJ standards yet for soil.

NJDEP SITE REMEDIATION PROGRAM

PFAS have been added to the NJDEP online services for all remedial phase reports and workplans. Therefore, Licensed Site Remediation Professionals (LSRPs) will evaluate these contaminants during all phases of the investigation (PA, SI, RI, and RA). Any analytical data indicating an exceedance of the GWQS for these compounds will need to be reported to the NJDEP and remediated.

ANALYSIS OF PFAS IN WATER SAMPLES IN NJ

The analytical laboratory selected for PFAS analysis must be certified by the NJDEP Office of Quality Assurance (OQA). The methods allowed by NJDEP for PFAS analysis in drinking water are EPA 537 Revision 1.1 and EPA 537.1. Care must be taken in PFAS sample collection to prevent sample contamination. A robust sampling protocol with stringent quality assurance/quality control (QA/QC) is key to ensuring the data used to make important decisions regarding PFAS are accurate and defensible.

FUNDING SOURCES

Grant-funding opportunities, low-interest loans and direct payments from potentially-responsible parties (PRPs) may be available should circumstances meet the funding criteria. Potential funding sources available to help address PFAS in drinking water supplies include:

- US Department of Agriculture - Rural Development, Water and Waste Disposal Loan and Grant Program;
- US Department of Defense, for groundwater impacts due to releases at military facilities;
- Impacted potable water systems, including private wells, may be eligible for funding through the NJ Spill Fund; and,
- PRPs, typically industries, responsible for the PFAS release.

DRINKING WATER TREATMENT

Method	Advantages	Disadvantages
Granular activated carbon (GAC)	Common use, can be regenerated, some PFAS strongly adsorbed	Some PFAS not well adsorbed
Adsorptive/exchange resins	Can tailor resin to specific PFAS, typically smaller footprint compared to GAC	Most are single use; must dispose of spent resin; less widely used
Reverse Osmosis (RO) and Nanofiltration	Effective against all PFAS, widely used and understood technology	High cost, produces a concentrated residual that must be disposed

Other treatment technologies are currently in development and / or testing stages, with the likelihood that a greater number of treatment options will be available in the future.

FOR ADDITIONAL INFORMATION, PLEASE CONTACT CINDY JACOBSEN AT CJACOBSEN@TANDMASSOCIATES.COM