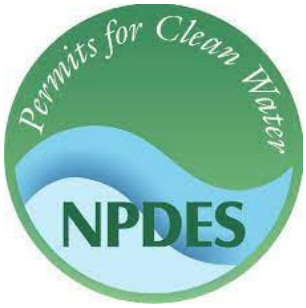
Society of SAME American Military Engineers

Environmental Community of Interest
Industry-Government Engagement PFAS Project
Avoiding PFAS Information Overload:
Targeted Training for Operational Entities

PFAS Considerations in Wastewater and Stormwater Permitting



The Clean Water Act of 1972 created the National Pollutant Discharge Elimination System (NPDES) Program, which regulates point sources of pollutants by requiring permits and setting standards to protect surface water quality. Until recently, per- and polyfluoroalkyl substances (PFAS) were not identified as pollutants. Regulations and guidance for the inclusion of PFAS constituents in NPDES permitting are evolving on both a national and state-by-state basis.

What is the NPDES Program?

The NPDES program is a permitting system that regulates point sources of water pollution with the goal of improving water quality, including waters impacted by PFAS.

Who issues NPDES permits?

The U.S. Environmental Protection Agency (EPA) has delegated permitting authority to all but three states (Massachusetts, New Hampshire, and New Mexico) and to the District of Columbia and several U.S. Territories. As part of the approval process for authorizing states to implement their NPDES program, EPA must approve the state's program. EPA maintains oversight and may retain control of any program components for which the state is not authorized. As noted below, EPA has recently provided guidance to states for incorporating PFAS into their programs.

What kind of permits are there?

Three primary types of permits are available: individual, general, and Municipal Separate Storm Sewer System (MS4).

Individual permits generally fall into two categories: (1) industrial and (2) domestic/municipal (or publicly owned treatment works [POTWs]). POTWs that receive industrial discharges require those industrial facilities to obtain a pre-treatment permit and can dictate what contaminants must be monitored, including PFAS. The industrial facilities' pre-treatment permit is required to contain the same technology-based limitations it would have if the industrial facilities had their own NPDES permit.

General permits are designed to cover a particular activity, such as the discharge of hydrostatic test water or stormwater. General permits will list the compliance requirements for the activity and may require submitting a notice to the permitting authority.

MS4 permits are designed to address non-point sources, and municipalities are required to develop a comprehensive Stormwater Management Program that includes a variety of measures to control stormwater quality, including potential PFAS impacts to stormwater discharges.

What is the basis for permit limits?

Different states may use slightly different terminology, but there are three main requirements that form the basis for permit limits: (1) surface water quality standards (SWQS), (2) procedures to implement the SWQS, and (3) federal categorical effluent limit guidelines (ELGs).

SWQS are the legal standards for the quality of surface water in the state. They are designed to protect the designated uses of each surface water body based on the protection of aquatic life, human health, domestic water supply, and recreation. These standards account for present, future, and potential uses. Eight states have established SWQS for specific PFAS.

Implementation procedures are the procedures that each state follows to establish conditions in a wastewater permit. The conditions are established after screening for toxic pollutants, determining water quality uses and criteria, evaluating impacts on water quality (anti-degradation), and establishing mixing zones and critical conditions. Permit limits are generally water-quality based (i.e., protect aquatic life), human-health based (i.e., protect people eating the aquatic life), or technology based (based on known capabilities of treatment systems to reliably achieve a specific concentration for a specific pollutant). Permit writers may also use best professional judgement (BPJ) when establishing permit conditions.

Federal categorical ELGs are national standards for industrial wastewater discharges to surface waters and POTWs. Federal categorical ELGs apply to 59 categories of industries, but not National Security. These guidelines set technology-based limits for specific pollutants. NPDES permit writers are required to include these technology-based limits when they are more stringent than limits derived from SWQS. EPA is presently completing the Multi-Industry PFAS Study to ascertain which industries will be required to monitor for PFAS.

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What is EPA's approach to PFAS in permitting?

EPA has a two-pronged approach for addressing PFAS in NPDES permits. The first approach is to look only at the 59 industries for which ELGs are required. These industries have been studied for their potential to discharge PFAS. Where PFAS have been identified, EPA is beginning to establish ELGs for those industries. Because National Security is not one of the industries, this approach has no impact on the U.S. Department of Defense (DoD). The second approach includes a memorandum to the states with guidance for how to include PFAS in permits ("Addressing PFAS Discharges in NPDES Permits and Through the Pretreatment Program and Monitoring Programs," December 5, 2022). This guidance specifically identifies remediation sites and military bases as potential PFAS sources. The crux of the memorandum is EPA's opinion that "site-specific technology-based limits for PFAS discharges developed on a BPJ-basis may be appropriate for facilities for which there are no applicable effluent guidelines."

What are the states doing about permitting PFAS?

Most states have not yet incorporated PFAS into their NPDES programs. Only 8 of the 47 delegated states have SWQS for PFAS. Some states have translated narrative standards (i.e., qualitative standards pertaining to nuisance levels of odor, color, and other conditions) into numerical standards, and permit writers can use BPJ to apply practice-based controls. PFAS SWQS vary among the states that have them, though human health criteria are consistently the most stringent criteria. Additionally, the approach as to how to include PFAS SWQS in NPDES permits also varies by state. Although effluent limitations are not normally established for stormwater-driven outfalls, one state (Michigan) has established PFAS limits for these types of outfalls. Another state (Wisconsin) will first collect data from a permitted facility to determine whether PFAS are present, then determine whether there is "reasonable potential" to exceed surface water criteria, and for those facilities, the permit will be modified to include a perfluorooctane sulfonic acid (PFOS)/perfluorooctanoic acid (PFOA) minimization plan. If implementation of the minimization plan is not found to be sufficiently effective, the state will then require treatment.

What are the most common sources of PFAS in stormwater from U.S. military bases?

Surface water runoff from fire training and nozzle testing areas and inadvertent discharges from fire suppression systems in aircraft hangars are common across many bases.

What are challenges for DoD in managing stormwater?

PFOA and PFOS were the primary components of legacy firefighting foams used at DoD installations and have, in many cases, impacted surface water. The extent of PFAS impacts to stormwater at DoD sites is not completely known because existing NPDES permits typically do not require PFAS monitoring. However, two primary challenges exist where PFAS are present: (1) the aging infrastructure of stormwater conveyance systems at military installations, which may consist of broken pipes and the potential for groundwater infiltration and/or inadvertent stormwater discharge; and (2) how to manage PFAS-impacted stormwater. DoD airfields can have large areas of impervious surfaces and high volumes of stormwater that must be discharged to water bodies that are often offsite from DoD property.

What is DoD doing to address PFAS in stormwater?

DoD established a PFAS Task Force in July 2019, and Congress codified it in statute in 2022. The PFAS Task Force is working to address PFAS issues in a cohesive, consistent manner while coordinating and communicating with external stakeholders and other federal agencies to ensure a consistent approach to this national issue. The PFAS Task Force continues to identify and provide DoD with the tools needed to address the effects of DoD's PFAS releases (to include limiting impacts from these sources to stormwater systems where feasible) and to ensure that DoD continues to protect the health of its service members, their families, the DoD civilian workforce, and the communities in which DoD serves.

The DoD PFAS website (www.defense.gov/pfas) offers additional information about DoD's actions to investigate and clean up PFAS resulting from DoD activities, DoD PFAS policies, the DoD PFAS Task Force, DoD PFAS community outreach activities, and PFAS research and development efforts.

Are there examples where DoD is addressing PFAS in stormwater?

Yes. A military base in Michigan was identified to be discharging up to 5 million gallons a day of PFOS-impacted stormwater into a river and lake. Concentrations of PFOS exceeded the state's SWQS. The main source of PFOS was determined to be a nozzle testing area where fire trucks routinely discharged aqueous film-forming foam to the ground. Two 100-gallon-per-minute stormwater treatment systems have been installed to reduce the levels of PFOS that are discharged to the water bodies.

About SAME

The Society of American Military Engineers (SAME) builds leaders and leads collaboration among government and industry to develop multidisciplined solutions to national security infrastructure challenges. Find out more about SAME here: https://www.same.org/about-same/.

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