

Firefighting foam use, replacement and disposal

Firefighting foams are essential tools used by fire departments and others to protect lives and property. However, firefighting foams can potentially cause risk to public health and the environment if improperly handled or disposed. The Minnesota Pollution Control Agency (MPCA) regulates the use and disposal of firefighting foams, in coordination with the Minnesota Department of Commerce (Commerce), the Minnesota Department of Health (MDH), and the State Fire Marshal Division of the Minnesota Department of Public Safety (SFMD). This fact sheet presents the MPCA's requirements and recommendations for firefighting foams.

Firefighting foams can be generally categorized as:

- Class A- for structural fires, and dry fuels like wood and paper.
The majority of firefighting foam used in Minnesota is Class A foam.
- Class B- for flammable liquids, such as petroleum, gasoline, diesel, and jet fuel.
Class B foam is used less frequently than Class A foam, but performs a vital role in vehicle, energy and chemical sector, military, and airport incident responses.

Class A foam

Class A foams are generally considered nontoxic and will biodegrade over time. Excess foam and unusable Class A foam concentrate may be discharged to a sanitary sewer if preapproved by the operator of the publicly owned treatment works (POTW, commonly known as a sewage treatment plant) receiving the discharge. Fire departments are encouraged to take reasonable steps they can during and after an incident to prevent finished Class A foam and foam-containing firefighting runoff water from entering stormwater systems or flowing to surface waters. Debris from fires on which Class A foam was used may be managed as solid waste.

Class B foam

Most legacy Class B foams contain intentionally-added fluorine-based compounds known as *per- and poly-fluoroalkyl substances* (PFAS, previously also known as *perfluorinated chemicals*, or PFCs). PFAS are not a single chemical, but a family of fluorine-containing compounds that persist in the environment, are known to bioaccumulate and cause human health risks, and that have contaminated land and water in Minnesota.

Firefighting foam users in Minnesota must assume that all legacy Class B foam and combination Class A/B foam concentrates contain PFAS unless the users have documentation from the manufacturer or another authority that shows that a specific Class B foam concentrate is fluorine-free (also known as *fluorine-free foam*, or F3).

Note: Class B foam concentrates marketed or labeled as “PFOS-free” or “PFOA-free” or “C8-free” may still contain PFAS and may not be fluorine-free. Though the acronyms are similar, PFOS and PFOA are specific single compounds in the larger PFAS family and were often replaced in Class B foam concentrates by other PFAS compounds or by fluorine-containing chemicals that can react to create PFAS. PFAS are not required to be listed on foam concentrate Safety Data Sheets even if present in the foam concentrate.

All use of PFAS-containing Class B foam in Minnesota is being phased out.

See [Phasing out use of PFAS-containing foam](#) on page 2 for timelines for different users.

The U.S. Department of Defense (DoD) has approved a new specification for fluorine-free Class B foam: MIL-PRF-32725. The U.S. Federal Aviation Administration (FAA) has stated that it will allow airport operators to use fluorine-free Class B foam that meets this standard to comply with FAA requirements.

F3 foams meeting the new DoD standard available for purchase are identified on the DoD's Qualified Products List, however the MPCA cautions that supply of these foams available to Minnesota users may be initially limited due to expected large demand from the DoD and major airport operators. Search for 'qualified products list' and then 'MIL-PRF-32725' information on the DoD's Defense Standardization Program website at: <https://www.dsp.dla.mil/>.

In addition to F3 products that meet the new DoD standard, the MPCA will also allow Minnesota users to rely on an independent testing organization, the Green Screen Certified™ label, to identify F3 products. You may find more information and a list of F3 products at: <https://www.greenscreenchemicals.org/>.

Phasing out use of PFAS-containing foam

All use of PFAS-containing foam is being phased out in Minnesota. Different users and locations have different timelines by which all use of PFAS-containing foam must be ended, including use at emergency incidents:

- Municipal and rural fire departments and most other users and locations, all use prohibited as of January 1, 2024, except for use at oil refineries and terminals or airports served by the department.
- All users at oil refineries and terminals - end all use by the end of 2025. Users at these locations may apply through the SFMD to extend the timeline until the end of 2027. For more information, contact the SFMD; see [More information](#) on page 5. No use of PFAS-containing foam off-site is allowed at any time.
- All users at airports – use allowed until the SFMD determines that F3 products that have been qualified by the FAA are commercially available in sufficient quantity. Until then, operators of airports at which PFAS-containing foam is used must annually report to the SFMD the status of the airport's conversion to F3 products. The MPCA will allow airport operators to use PFAS-containing foam off-site only for aircraft rescue and firefighting (ARFF) incidents until the SFMD makes the above determination.
- Use in fixed fire suppression systems in airport hangars - may be used until July 1, 2025, or until the SFMD makes the determination discussed above, whichever is later.

Until their use of PFAS-containing foam is phased out under these timelines, operators of oil refineries and terminals and of airports where PFAS-containing foam is used during emergency incidents are encouraged, though not required, to take reasonable steps during and after an incident to prevent finished Class B foam and foam-containing firefighting runoff water from entering stormwater systems or flowing to surface waters.

Reporting releases of PFAS-containing foam

Until all use of PFAS-containing foam is phased out under the timelines above, any use or release of PFAS-containing foam must immediately be reported by the user to the Minnesota Duty Officer.

See [More information](#) on page 5.

PFAS use and release reports must include:

- Date, time, and location of the use or release.
- Estimated volume of PFAS-containing foam used, discharged, or released.
- Purpose or reason for the use, discharge, or release.
- Description of the containment, treatment, and disposal measures taken.

Discharge of PFAS-containing foam for training prohibited unless required by law

Until their use of PFAS-containing foam is phased out under the timelines above, remaining users may only discharge PFAS-containing foam for training if they are required to by federal law. All discharged foam must be contained, collected, properly disposed, and reported as above.

Discharge of PFAS-containing foam for testing prohibited unless discharge collected

Until their use of PFAS-containing foam is phased out under the timelines above, remaining users may not discharge PFAS-containing foam for necessary equipment testing unless they ensure that all discharged foam will be contained, collected, properly disposed, and reported as above.

Note: Because no current cleaning methods have yet been shown to completely remove all PFAS residues from existing tankage, piping, and firefighting appliances that have been used with PFAS-containing Class B foam, the MPCA recommends that fire departments and other users still consider all wastes from use of F3 products in legacy equipment, including discarded foam concentrate, finished foam, and runoff water, to be PFAS-contaminated for cleanup, disposal, and site remediation purposes, even if the equipment is [cleaned using the methods described](#) starting on page 4.

Disposal of PFAS-containing foam concentrate

PFAS-containing foam concentrate may not be disposed to a storm sewer. PFAS-containing foam concentrate may not be disposed to a sanitary sewer unless preapproved by the sanitary sewer system operator. The MPCA recommends that PFAS-containing foam concentrate be disposed by either hazardous waste incineration or in a hazardous waste landfill after being solidified.

Fire departments and other users may contact their regional Very Small Quantity Generator (VSQG) Collection Program, utilize the state hazardous waste management vendor contract (#H-69) through the Minnesota Department of Administration's Cooperative Purchasing Venture (CPV), or independently hire a hazardous waste disposal vendor.

- See MPCA fact sheet #w-hw2-51, Very Small Quantity Generator Collection Programs, at: <https://www.pca.state.mn.us/sites/default/files/w-hw2-51.pdf>.
- Search for 'CPV' information on the Department of Administration's website at: <https://mn.gov/admin/>.

Disposal of PFAS-containing finished foam and runoff water

Collected PFAS-containing finished foam and runoff water may not be disposed to a storm sewer without treatment and without the approval of the storm sewer system operator. Any disposal of collected PFAS-containing finished foam and runoff water to a sanitary sewer before or after treatment must be pre-approved by the sanitary sewer system operator. The MPCA recommends that finished PFAS-containing foam and runoff water be treated with granular activated carbon (GAC) filtration or other methods on-site or off-site until any detected PFAS is below the current MDH 'Health-Based Values for PFAS in Drinking Water', available on the MDH's website at: <https://www.health.state.mn.us>. Dilution with clean water is not treatment.

Disposal service for PFAS-containing foam and runoff water is available through the CPV as well as disposal of PFAS-containing foam concentrate. See [Search for CPV information](#) above.

Cleanup and remediation of sites contaminated with PFAS-containing foam

Releases of PFAS-containing foam may be subject to liability under the Minnesota Environmental Response and Liability Act (MERLA, also known as the 'State SuperFund' law). For more information on cleanup and site remediation under MERLA, contact the MPCA. See [More information](#) on page 5.

Replacing PFAS-containing foam and contaminated firefighting appliances

Due to the potential for continuing residual contamination, the MPCA advises that users carefully consider the feasibility of replacing PFAS-contaminated firefighting equipment instead of cleaning and reuse. However, replacing equipment is not required by law; the MPCA does not consider the use of F3 products in cleaned legacy equipment to violate the PFAS-containing foam use prohibitions.

You may manage discarded contaminated firefighting appliances, apparatus, and other equipment as scrap metal or as normal solid waste. Though such items are not regulated hazardous wastes in Minnesota due to potential PFAS contamination, the MPCA recommends managing them equivalent to hazardous scrap metal. See MPCA fact sheet #w-hw4-27, Hazardous scrap metal, at: <https://www.pca.state.mn.us/sites/default/files/w-hw4-27.pdf>.

Cleaning and reuse of contaminated firefighting apparatus, tankage, and piping

For fire apparatus with integrated Class B foam tankage, fixed Class B foam systems in buildings, and other firefighting equipment previously used with PFAS-containing Class B foam that are not feasible to replace, the MPCA strongly recommends that the equipment first be completely drained and then cleaned as described below. Fire apparatus without integrated Class B foam tankage do not need to be cleaned, though firefighting equipment stored on the apparatus that have been used with Class B foam, such as appliances and hoses, would be recommended for replacement when feasible or cleaning if they cannot feasibly be replaced.

Do not allow F3 products to mix with PFAS-containing foam concentrate or uncleaned residue. Allowing F3 products to contact PFAS-containing foam residue in uncleaned equipment may cause gelling, equipment damage, and other problematic reactions, and could contaminate the new foam. Multiple cleaning steps are needed; PFAS-containing foams have been shown to form residues and coatings on piping and tank walls that are not removed by draining or even a single rinse.

Note: Only portions of the apparatus water system that contained or carried Class B foam concentrate need to be cleaned. Equipment that contained or carried only water upstream of the foam system, such as water tanks and the water pump, do not need to be cleaned. The following directions referring to a system fill or system drain apply only to the foam-handling portion of the apparatus water system.

Draining

Prior to cleaning, all PFAS-containing foam concentrate must first be completely drained from the foam system, including all Class B foam tankage, piping, and foam control and monitoring equipment. To promote complete draining from fire apparatus, the MPCA recommends first draining the foam system to a no-drip state at the lowest accessible point, then driving the apparatus with turns in both directions and travel both uphill and downhill, followed by re draining from the lowest point.

Cleaning

Minnesota fire departments and other users may choose to clean their own equipment or contract with a specialized cleaning service vendor. Some vendors may use proprietary cleaning products that are claimed to improve PFAS residue removal effectiveness. The MPCA cannot verify vendor cleaning effectiveness claims or make vendor recommendations. Contact MPCA Pollution Prevention staff at P2.PCA@state.mn.us or at the telephone numbers below for available information on cleaning service vendors.

Whether using a vendor or self-cleaning, Minnesota municipal, rural, and airport fire departments may choose to coordinate a common location for equipment or vendor services to lower costs. The hosting department is responsible for ensuring all waste generated on their site is properly managed.

For cleaning, the MPCA recommends triple-rinsing the entire foam system with hot water at a maximum temperature of no more than 140°F for safety. In addition, ensure the maximum temperature is below the manufacturer's recommended exposure limits for any of the components to be cleaned. Each separate rinse cycle should consist of a complete system fill, two-hour soak, and drain. Collect all rinse water and manage it as [PFAS-containing foam runoff water](#) as discussed on page 3. Repeat the above process for three complete cycles, then fill the system with F3 foam concentrate.

Continuously recirculating the rinse water during the third soak time may increase PFAS residue removal effectiveness, if feasible for the equipment being cleaned. To minimize potential foaming during the recirculation, either carefully purge the system of all air or use a commercial anti-foaming product.

Documentation

The MPCA recommends that firefighting apparatus and equipment cleaning be documented in the permanent maintenance and inspection logs and provided to any subsequent purchasers and users of the apparatus or equipment.

F3 Class B foam

Disposal of F3 finished foam and runoff water

Excess foam and unusable F3 foam concentrate may be discharged to a sanitary sewer if preapproved by the operator of the POTW receiving the discharge. All F3 users are encouraged to take reasonable steps during and after an incident to prevent finished F3 foam and foam-containing firefighting runoff water from entering stormwater systems or flowing to surface waters. Debris from fires on which F3 foam was used may be managed as solid waste unless hazardous for other reasons, such as if it contains petroleum fuel.

More information

Guidance in this fact sheet was compiled from Minn. Stat. 325F.072; 2023 Session Law, Ch. 60, Art. 3, Sec. 31; and 2024 Session Law, Ch. 116, Art. 2, Sec. 31, in coordination with the SFMD, MDH, and Commerce, and incorporates regulatory interpretation decisions made by the MPCA on May 29, 2020; June 10, 2020; April 20, 2023; January 4, 2024; and May 17, 2024.

Minnesota Pollution Control Agency

Toll free (all staff) 1-800-657-3864
All staff 651-296-6300
..... <https://www.pca.state.mn.us/>

Minnesota Duty Officer

Toll free 1-800-422-0798
Metro 651-649-5451

State Fire Marshal Division

All staff..... 651-201-7200
..... <https://dps.mn.gov/divisions/SFM/>

Minnesota Department of Health

All staff..... 651-201-5000
..... <https://www.health.state.mn.us/>