

Interim Guidance on the Destruction and Disposal of Perfluoroalkyl and Polyfluoroalkyl Substances and Materials Containing Perfluoroalkyl and Polyfluoroalkyl Substances

Released for Public Comment on April 16, 2024

Overview 4/29/24 Information for Tribes

Updated interim guidance announced in the Federal Register on April 8, 2024

Open for public comment until October 15, 2024

- [Docket link](#)

- Fiscal Year 2020 National Defense Authorization Act (NDAA) requirements for EPA
- The EPA's PFAS Destruction & Disposal Interim Guidance
 - Updates in 2024
 - Ongoing research needs
 - Opportunities for public comment
- Presentation by Dr. Thabet Tolaymat on recent EPA landfill research
- Q&A with EPA subject matter experts

Section 7361 of the FY 2020 NDAA required EPA to:

- Publish interim guidance on the destruction or disposal of PFAS and PFAS containing materials including six specific PFAS containing materials
- Take into consideration the potential for PFAS releases during destruction or disposal and potentially vulnerable populations living near likely destruction or disposal sites
- Provide guidance on testing and monitoring for releases near potential destruction or disposal sites
- Revise the interim guidance at least every 3 years, as appropriate

Interim Guidance Provides Scientific Information on:

- Manufacture and use of PFAS and PFAS-containing materials
- Destruction and disposal (D&D) technologies
- Emerging D&D technologies
- Assessment of impacts of potential releases on communities, including potentially vulnerable populations
- EPA's PFAS research program and research needs

PFAS Containing Materials Identified in the FY 2020 NDAA

- The interim guidance covers the six PFAS containing materials:
 - 1) aqueous film-forming foam;
 - 2) soil and biosolids;
 - 3) textiles, other than consumer goods, treated with PFAS;
 - 4) spent filters, membranes, resins, granular carbon, and other waste from water treatment;
 - 5) landfill leachate containing PFAS; and
 - 6) solid, liquid, or gas waste streams containing PFAS from facilities manufacturing or using PFAS.

Destruction and Disposal Technologies

- Includes the following information, where available, on thermal treatment, landfills, and underground injection:
 - Types of treatment within the technology “class”
 - Ability to destroy/contain PFAS, and control measures for PFAS if not destroyed
 - Potential for releases
 - Testing and monitoring
 - Uncertainties/unknowns and prioritized research needs
 - Technology and infrastructure considerations
 - Costs and availability

Underground Injection

- Permitted deep injection wells (Class I) for hazardous and non-hazardous materials can minimize migration of PFAS into the environment
- Limitations include:
 - Only liquid waste streams
 - Availability of Class I wells
 - Suitability of geology for development of new Class I wells
 - Cost
- Uncertainty:
 - Limited understanding of the long-term fate and transport properties of PFAS (including precursors) in the deep injection zone

Landfills

- Recent research has shown that the type of PFAS and the components of mixed waste will impact the ability to control PFAS migration from landfills
 - Stable polymeric PFAS vs volatile, water soluble or oxidizable PFAS
 - Organic/biodegradable components in the waste
- Uncertainties include:
 - Understanding of long-term PFAS fate and migration in landfills
 - Lack of information on amounts and concentrations of PFAS and precursor compounds in wastes
 - Lack of sampling and analytical methodologies
 - Efficacy of leachate and gas treatment for PFAS

Thermal Treatment

- Hazardous waste combustors may be effective at destroying PFAS and minimizing products of incomplete combustion (PICs) when operating under certain conditions
 - Conditions include feeding liquid PFAS-containing materials, higher temperatures $>1,100^{\circ}\text{C}$, well-mixed, and with adequate residence time (based on limited research)
- Newly released analytical methods will improve emissions and PIC characterization
 - OTM-45 for select PFAS
 - OTM-50 for volatile fluorinated compounds

Thermal Treatment (cont.)

- Key uncertainties include:
 - Operating temperatures adequate to completely destroy PFAS
 - break all C-F bonds
 - Formation and ID of PICs
 - Lack of emissions characterization data/emission control efficiency
- Updated guidance recommends air emission testing prior to full scale thermal treatment and provides a test plan outline (see Appendix A)

Interim Storage

- Interim storage may be an option when
 - Immediate destruction or disposal is not imperative;
 - On-site capacity is readily available; and
 - Proper controls are in place to reduce potential releases
- More appropriate for some materials than others
 - Recommended for low volumes of containerized materials or high PFAS-concentration materials

Emerging D&D Technologies

- Describes technology development
- Summarizes EPA's PFAS Innovative Treatment Team (PITT) efforts which reviewed proposed D&D methods
- Presents a Technology Evaluation Framework for evaluating and selecting a technology
 - Based on technology, material, analytical methods, efficacy, community considerations & regulatory requirements
 - Can also be used by technology developers and vendors as an outline for information-sharing

Potentially Vulnerable Populations Near D&D Sites

- Interim guidance includes considerations for potentially vulnerable populations living near likely destruction or disposal sites
 - Defines the properties of vulnerability and potential for disproportionate impacts (e.g., environmental justice concerns)
 - Describes how to consider vulnerable populations when assessing the potential impact of releases
 - Provides links to EPA's tools for developing risk assessments that incorporate vulnerability

Research Needs on PFAS D&D

- The interim guidance identifies broad areas where further research is needed:
 - Better characterize PFAS-containing materials targeted for destruction or disposal
 - Improve our understanding of the performance of PFAS destruction and disposal methods
- Specific research needs were prioritized as *high*, *medium*, or *low* to help inform future versions of this guidance
- EPA, DoD, and others are conducting relevant research in these areas; EPA seeks collaborative access to facilities to generate additional data to address information gaps

EPA Research on PFAS Destruction & Disposal

- EPA's robust PFAS research and development program includes near-term research on:
 - Methods for sampling and analyzing PFAS and PFAS-containing media and waste
 - Incineration conditions needed to fully defluorinate PFAS (break all C-F bonds)
 - Effectiveness of full-scale PFAS incineration operations
 - Review and testing of novel and available PFAS destruction solutions
 - PFAS destruction efficiency during reactivation, regeneration, and disposal of PFAS-containing treatment media (e.g., GAC and ion exchange resins)
 - PFAS management in landfills, including solidification and stabilization techniques
 - Alternate PFAS treatment methods for disposal and destruction
- Additional information on EPA's PFAS research is available at <https://www.epa.gov/chemical-research/research-and-polyfluoroalkyl-substances-pfas>

Next Steps

- EPA is now accepting public comments on the interim guidance
- For your comments to be considered in a future version of the interim guidance, please upload them to the docket by October 15, 2024

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*INTERIM GUIDANCE FOR PUBLIC COMMENT
APRIL 8, 2024*

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Comments Due Oct 15, 2024

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Thank you!

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