

Updated Interim Guidance on PFAS Destruction and Disposal from U.S. EPA (2024)

Battelle 2024 Chlorinated Conference

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Overview

- Fiscal Year 2020 National Defense Authorization Act (NDAA) requirements for EPA
- The EPA's PFAS Destruction & Disposal Interim Guidance
 - Update published April 8, 2024
 - Ongoing research needs
 - Opportunities for public comment

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
 - 2020 comments were incorporated into the 2024 version

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

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
- Uncertainties include:
 - 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 PFAS content of mixed wastes entering landfills
 - 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.)

- 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

Interim Guidance on the Destruction and Disposal of Perfluoroalkyl and Polyfluoroalkyl Substances and Materials Containing Perfluoroalkyl and Polyfluoroalkyl Substances— Version 2 (2024)

INTERIM GUIDANCE FOR PUBLIC COMMENT
APRIL 8, 2024

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Interim Guidance on the Destruction and Disposal of Perfluoroalkyl and Polyfluoroalkyl Substances and Materials Containing Perfluoroalkyl and Polyfluoroalkyl Substances; Notice of Availability for public comment

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Interim PFAS Destruction and Disposal Guidance; Notice of Availability for Public Comment

Agency Environmental Protection Agency | Posted Apr 16, 2024 | ID EPA-HQ-OLEM-2020-0527-0132

 Comment

Comments Due Oct 15, 2024

Give Feedback

Questions?

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Accepting public comments until October 15, 2024:

<https://www.regulations.gov/docket/EPA-HQ-OLEM-2020-0527/document>