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ENERGY, INSTALLATIONS,
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7/11/23

MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY (INSTALLATIONS,
ENERGY AND ENVIRONMENT)
ASSISTANT SECRETARY OF THE NAVY (ENERGY,
INSTALLATIONS AND ENVIRONMENT)
ASSISTANT SECRETARY OF THE AIR FORCE
(INSTALLATIONS, ENVIRONMENT AND ENERGY)
DIRECTOR, DEFENSE LOGISTICS AGENCY (LOGISTICS
OPERATIONS)

SUBJECT: Interim Guidance on Destruction or Disposal of Materials Containing Per- and Polyfluoroalkyl Substances in the United States

The DoD Per- and Polyfluoroalkyl Substances (PFAS) Task Force issues this interim guidance to help DoD make informed decisions in the evaluation of existing destruction and disposal options, and to comply with section 343 of the FY 2022 National Defense Authorization Act (NDAA). Section 343 requires DoD to prohibit the incineration of covered DoD PFAS-containing materials¹ until DoD issues guidance implementing the U.S. Environmental Protection Agency (EPA) “Interim Guidance on the Destruction and Disposal of Perfluoroalkyl and Polyfluoroalkyl Substances and Materials Containing Perfluoroalkyl and Polyfluoroalkyl Substances,” December 18, 2020 (hereinafter referred to as the EPA guidance), and section 330 of the FY 2020 NDAA.

Concurrent with its compliance with these requirements on PFAS destruction and disposal, DoD is transitioning to a PFAS-free firefighting agent for land-based applications over the next few years. DoD has determined that this transition, which requires the removal of PFAS-containing firefighting foam (i.e., Aqueous Film Forming Foam (AFFF)) from installation fire protection inventories, will generate large quantities of PFAS-containing concentrate and rinsate for which DoD must find a safe disposal solution. In addition, quantities of PFAS-containing material are generated from DoD’s nationwide cleanup program, and recovery of emergency use discharges or spills of AFFF. Given these combined quantities, DoD’s long-term storage capabilities will be exceeded and thus DoD requires a comprehensive destruction and disposal strategy.

In choosing among disposal options, one of the most significant factors for DoD was the additional oversight and controls provided at disposal and destruction facilities with

¹ PFAS-containing materials covered under this guidance includes all “covered material” under Section 343 of the FY 2022 NDAA, which means “any [Aqueous Film Forming Foam] AFFF formulation containing PFAS, material contaminated by AFFF release, or spent filter or other PFAS-contaminated material resulting from site remediation or water filtration that—

- (A) has been used by the Department of Defense or a military department;
- (B) is being discarded for disposal by the Department of Defense or a military department; or
- (C) is being removed from sites or facilities owned or operated by the Department of Defense.”

Attachment 1 — DoD Guidance on Options for the Destruction and Disposal of PFAS-Containing Materials and Implementation of Section 343 of the FY 2022 NDAA

1. DoD Implementation of the EPA’s “Interim Guidance on the Destruction and Disposal of Perfluoroalkyl and Polyfluoroalkyl Substances and Materials Containing Perfluoroalkyl and Polyfluoroalkyl Substances,” December 18, 2020

The EPA issued the “Interim Guidance on the Destruction and Disposal of Perfluoroalkyl and Polyfluoroalkyl Substances and Materials Containing Perfluoroalkyl and Polyfluoroalkyl Substances,” on December 18, 2020, (referred to as “the EPA guidance” in this document).² In the EPA guidance, EPA evaluated destruction and disposal technologies that are commercially available and have the potential to control the migration of PFAS to the environment and identified three destruction or disposal options: landfilling, thermal treatment, and underground injection. DoD reviewed the EPA guidance and is implementing that guidance through this interim policy. Specifically, DoD is using the EPA guidance to help DoD make informed decisions in the evaluation of existing destruction and disposal options, including the relative uncertainty associated with each technology’s capability to control releases to the environment for the protection of human health. DoD is also implementing EPA’s guidance on environmental justice considerations in disposal and destruction of PFAS-containing materials.

A. EPA Interim Guidance on Destruction and Disposal of PFAS and Materials Containing PFAS

EPA’s guidance recognizes that interim storage is not a destruction or disposal method, but asserts that storage “may be an option” if the immediate destruction or disposal of PFAS-containing materials is “not imperative.”³ EPA defines “interim storage” as storage “estimated to be anywhere from 2 to 5 years.”⁴ EPA does not define the term “imperative.” DoD finds that multi-year storage of large quantities of PFAS-containing materials is not a viable option, from either a safety, environmental, logistical, or economic perspective.⁵ Thus, in general, DoD assesses that, due to the volume of PFAS-containing materials at issue, DoD will need to implement actual destruction or disposal solutions for those materials.

DoD is currently conducting cleanup investigations and response actions at over 700 military installations and State Guard facilities. These investigations and response actions generate PFAS-containing materials (e.g., granular activated carbon, soils, investigation-derived wastes). If DoD had to plan for, locate, and secure storage of all PFAS-containing materials at

² “Interim PFAS Destruction and Disposal Guidance (Notice of Availability for Public Comment).” 85 Federal Register 83554 (Dec. 22, 2020).

³ “Interim Guidance on the Destruction and Disposal of Perfluoroalkyl and Polyfluoroalkyl Substances and Materials Containing Perfluoroalkyl and Polyfluoroalkyl Substances,” pp. 5. Environmental Protection Agency, 18 Dec. 2020, <https://www.epa.gov/pfas/interim-guidance-destroying-and-disposing-certain-pfas-and-pfas-containing-materials-are-not>. Referred to as “EPA Interim PFAS Disposal Guidance (Dec. 2020)” in later footnotes.

⁴ EPA Interim PFAS Disposal Guidance (Dec. 2020), page 5.

⁵ EPA’s proposed PFAS National Primary Drinking Water Regulation similarly states: “As part of this rulemaking, EPA considered that in drinking water treatment, large volumes of spent [granular activated carbon] and ion exchange resin must be removed which does not lend itself to on-site storage over time. The disposal options identified in the Interim Guidance (US EPA, 2020b) are landfill disposal and thermal treatment.” 88 Federal Register at 18686 (Mar. 29, 2023).

Consistent with the EPA guidance, DoD next considered permitted hazardous waste landfills. Hazardous waste landfills “have the most stringent environmental controls in place and higher potential capacity to manage the migration of PFAS into the environment.”⁸ Hazardous waste landfills are “more effective at minimizing PFAS migration into the environment than other landfill types.”⁹ Because “permitted hazardous waste landfills employ the most extensive set of environmental controls (e.g., double liner systems with leachate collection and leak detection) and practices (e.g., extensive record keeping) that are currently available for the containment of PFAS waste,” DoD has identified these landfills as an available disposal option that maximizes reduction of PFAS releases or emissions to the environment and human health exposures.¹⁰

DoD next considered solid waste landfills. The EPA guidance identifies a variety of solid waste landfills: municipal solid waste, ash monofill, industrial, and construction and demolition landfills.¹¹ Because environmental controls can vary at landfills, EPA evaluated the viability of landfilling as a means of containing PFAS. Modern solid waste landfills “when constructed with appropriate controls (e.g., liner system and leachate and gas collection and management systems), can also control the migration of PFAS into the environment.”¹² DoD has identified solid waste landfills with these controls in place (composite liner and gas and leachate collection and management) as an available disposal option that maximizes reduction of PFAS releases or emissions to the environment and human health exposures. Any solid waste landfill DoD uses for PFAS-containing materials must have a composite liner, gas and leachate collection and management systems, and an environmental permit.

The DoD Components, consistent with the Decision Tree in Attachment 2, will need to consider the type of PFAS-containing materials when considering the use of both hazardous waste and solid waste landfills. For example, liquids must be solidified to remove any free liquids before disposal in a landfill, which may increase the volume significantly (e.g., threefold).¹³ The cost and availability of all destruction and disposal options are additional considerations that need evaluation.

DoD next considered thermal treatment technologies, recognizing that these options have higher levels of uncertainties regarding their capacity to control the migration of PFAS into the environment. Thermal treatment technologies include a wide-variety of technologies and controls, including hazardous waste combustors (e.g., incinerators, cement kilns, lightweight aggregate kilns), as well as other thermal treatment (e.g., carbon reactivation units, sewage sludge incinerators, municipal waste combustors, thermal oxidizers).¹⁴ EPA, notwithstanding its acknowledgment of uncertainties with PFAS thermal treatment technologies, recognized that the subset of permitted hazardous waste combustors “may operate under conditions more conducive to destroying PFAS and controlling related [products of incomplete combustion] PICs relative to

⁸ EPA Interim PFAS Disposal Guidance (Dec. 2020), page 5.

⁹ EPA Interim PFAS Disposal Guidance (Dec. 2020), page 6.

¹⁰ EPA Interim PFAS Disposal Guidance (Dec. 2020), page 6.

¹¹ EPA Interim PFAS Disposal Guidance (Dec. 2020), page 56.

¹² EPA Interim PFAS Disposal Guidance (Dec. 2020), page 55.

¹³<https://www.geoengineer.org/education/web-class-projects/cee-549-geoenvironmental-engineering-winter-2013/assignments/stabilization-solidification> (“Volume of the treated wastes usually increases significantly”)

¹⁴ EPA Interim PFAS Disposal Guidance (Dec. 2020), page 6.

thermal treatment units that do not have both [Resource Conservation and Recovery Act] RCRA and [Clean Air Act] CAA permits.¹⁵ EPA also recognized that permitted hazardous waste incinerators “are designed to optimize temperatures, residence times, turbulence, and other parameters” to “maximize organic destruction and minimize the formation of PICs.”¹⁶ These controls include pollution control devices which can remove hydrogen fluoride and other products of combustion.¹⁷ After considering the latest studies and additional information¹⁸ presented in the next section of this guidance on implementation of section 330 of the FY 2020 NDAA, DoD has identified hazardous waste incinerators as an available destruction option that maximizes reduction of PFAS releases or emissions to the environment and human health exposures.

Because DoD, and others, have widely utilized granular activated carbon (GAC) to remove PFAS from drinking water and groundwater, and “GAC reactivation is economically favored over replacement with virgin carbon,”¹⁹ DoD also considered carbon reactivation units.²⁰ While carbon reactivation units “use high temperatures to thermally desorb contaminants from GAC, which allows for the carbon to be used again,” they are not “incinerators” and instead are a form of recycling/preserving virgin materials. While there are about seventeen commercial carbon reactivation units across the country, currently only four “operate under RCRA permits and applicable air permits” which “provide additional regulatory oversight and include operating requirements and emission limitations to be and effectively treat the hazardous contaminants.”²¹ Due to these additional safeguards, RCRA-permitted carbon reactivation units “may operate under conditions more conducive to destroying PFAS and controlling related PICs.”²² Therefore, DoD has identified RCRA permitted carbon reactivation units as an available destruction option to address PFAS-containing GAC that maximizes reduction of PFAS releases or emissions to the environment and human health exposures.

B. EPA Guidance on Environmental Justice

DoD also considered section 4 of the AEP guidance, which addresses environmental justice and impacts on vulnerable communities. The recent April 2023 Executive Order on “Revitalizing Our Nation’s Commitment to Environmental Justice for All,”²⁴ emphasizes that every person has a right to breathe clean air, drink clean water, and live in a healthy community. Under Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations”, Federal agencies are directed to identify and address,

¹⁵ EPA Interim PFAS Disposal Guidance (Dec. 2020), page 35.

¹⁶ EPA Interim PFAS Disposal Guidance (Dec. 2020), page 35.

¹⁷ EPA Interim PFAS Disposal Guidance (Dec. 2020), pages 33-35.

¹⁸ Several of those studies post-date EPA’s December 2020 Guidance and its findings on relative uncertainty.

¹⁹ EPA Interim PFAS Disposal Guidance (Dec. 2020), page 95.

²⁰ EPA’s proposed PFAS National Primary Drinking Water Regulation similarly states: “At present, the most likely management option for spent materials containing PFAS is reactivation of GAC and incineration for spent IX resin.” 88 Federal Register at 18686 (Mar. 29, 2023).

²¹ EPA Interim PFAS Disposal Guidance (Dec. 2020), page 36.

²² EPA Interim PFAS Disposal Guidance (Dec. 2020), page 36.

²³ EPA Interim PFAS Disposal Guidance (Dec. 2020), page 36.

²⁴ “Executive Order 14096 of April 21, 2023, Revitalizing Our Nation’s Commitment to Environmental Justice for All,” Federal Register, no. 80 (April 26, 2023): 25251-25261. <https://www.govinfo.gov/content/pkg/FR-2023-04-26/pdf/2023-08955.pdf>

as appropriate, “disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations.”²⁵ In Executive Order 14008, “Tackling the Climate Crisis at Home and Abroad,” Federal agencies shall “develop programs, policies, and activities to address the disproportionately high and adverse human health, environmental, climate-related and other cumulative impacts on disadvantaged communities, as well as the accompanying economic challenges of such impacts.”²⁶ DoD is also a signatory to a Memorandum of Understanding on Environmental Justice, and a member of the Environmental Justice Interagency Council under these Executive Orders. DoD considered these White House documents, as well as the EPA guidance, in determining what currently available disposal and destruction options should be included in this interim guidance.

As the EPA guidance notes, certain communities “may be highly exposed to environmental contaminants because they live or work near the sources of release or presence in the environment.”²⁷ This includes “those living near and using PFAS-contaminated environments (e.g., drinking water, fishing, hunting, and recreation).”²⁸ DoD acknowledges that many of the communities surrounding our military installations are communities with environmental justice concerns. We have prioritized our cleanup program to address the highest risks first, regardless of the community demographics, and address exposures (e.g., drinking water) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as Superfund). Environmental justice principles are incorporated into CERCLA through public participation in the cleanup process, as well as the additional public outreach and engagement that DoD conducts (e.g., Restoration Advisory Boards). It is this cleanup program that addresses high exposures to PFAS that generates a large volume of PFAS-containing materials for disposal. Impact on vulnerable communities is thus addressed primarily in our cleanup program, and we support the Superfund Community Involvement Toolkit referenced in the EPA guidance. DoD is working on improving its public outreach and community dialogue for our PFAS cleanups through expanded public outreach at both senior leadership and local levels, a more user-friendly DoD PFAS website, and updating our Restoration Advisory Board guidance. We also note that EPA’s Office of Land and Emergency Management is working with DoD and State representatives to develop “approaches to characterizing communities adjacent to three federal facility [National Priority List] NPL sites, to identify those with [Environmental Justice] EJ concerns.”²⁹ When completed, these projects will inform EPA’s understanding of best practices and be publicly shared. DoD supports this approach.

We also considered the vulnerable communities that exist near landfills and hazardous waste incinerators. We found this to be more complex in helping to choose among existing

²⁵ “Executive Order 12898 of February 11, 1994, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” *Code of Federal Regulations*, title 3 (1994): 1-101, <https://www.archives.gov/files/federal-register/executive-orders/pdf/12898.pdf>.

²⁶ “Executive Order 14008 of January 27, 2021, Tackling the Climate Crisis at Home and Abroad,” *Federal Register* 86, no. 19 (February 1, 2021): 7619-7633, <https://www.govinfo.gov/content/pkg/FR-2021-02-01/pdf/2021-02177.pdf>.

²⁷ EPA Interim PFAS Disposal Guidance (Dec. 2020), page 87.

²⁸ EPA Interim PFAS Disposal Guidance (Dec. 2020), page 87.

²⁹ EPA Office of Land and Emergency Management, “EJ Action Plan. Building Up Environmental Justice in EPA’s Land Protection and Cleanup Programs (Sept. 2022), page 25.

disposal and destruction options. For example, studies have identified that a disproportionate number of landfills and other hazardous waste facilities, such as incinerators, are located in communities with environmental justice concerns. DoD also used EPA's Environmental Justice Screening and Mapping Tool ("EJScreen")³⁰ to identify potentially impacted communities living near PFAS destruction or disposal sites identified in this guidance, as well as communities surrounding our military installations where PFAS cleanups are ongoing and AFFF will be replaced. DoD also considered the relative risk between its top priority of addressing elevated levels of PFAS in drinking water from DoD activities versus indirect potential PFAS exposures from destruction and disposal facilities.

In choosing among disposal options, however, one of the most significant factors for DoD was the additional oversight and controls provided at disposal and destruction facilities with environmental permits. We recognize the statutory authority and responsibility of the EPA and State environmental regulatory agencies to regulate the disposal of wastes that may threaten human health or the environment, and to issue environmental permits that are protective of human health and the environment. Section 4 of the EPA guidance thus focuses on considering vulnerable populations and community engagement in the regulatory siting or permitting processes for destruction and disposal facilities. DoD acknowledges that more work is needed to ensure that the impacts associated with the operation of destruction and disposal facilities are equitable. While DoD does not have a regulatory role, we encourage regulators and disposal facilities to consider PFAS in these regulatory processes. In addition, to facilitate engagement with communities near our military installations, as well as possibly adjacent to PFAS destruction and disposal facilities, we have developed a DoD PFAS Disposal Fact Sheet that will be posted on our DoD PFAS website (<https://www.acq.osd.mil/eie/ee/ecc/pfas/index.html>). This fact sheet summarizes this DoD PFAS disposal guidance, provides background information on PFAS and potential health effects based on EPA and the Agency for Toxic Substances and Disease Registry statements, and provides information on how DoD is incorporating environmental justice principles when addressing PFAS. DoD will also explore new partnership opportunities with EPA and other federal agencies to advance environmental justice issues in accordance with Executive Order 14096.

C. DoD Implementation

DoD is therefore identifying the following options, **in order of priority**, for the DoD Components to utilize for the destruction or disposal of PFAS-containing materials, including AFFF, that are not hazardous wastes:³¹

- **Carbon reactivation units with environmental permits (for used GAC only).**
GAC is a common PFAS water treatment technique where PFAS attaches to the

³⁰ See <https://www.epa.gov/ejscreen>.

³¹ Hazardous waste is regulated pursuant to RCRA authority. See 42 U.S.C. § 6903. The regulatory definition of hazardous waste is found in 40 CFR § 261.3. PFAS is currently not a listed or characteristic hazardous waste, but a PFAS-containing material may meet the regulatory definition of hazardous waste if PFAS is mixed with a listed hazardous waste or if a PFAS-containing mixture exhibits a hazardous characteristic (e.g., ignitability). Materials that qualify as a RCRA hazardous waste must follow RCRA storage and disposal requirements and are outside of the scope of this guidance.

carbon until the carbon is full. Carbon reactivation units use high temperatures to thermally treat contaminants collected in GAC, which allows for the carbon to be used again. Carbon reactivation units permitted under RCRA and the CAA have additional regulatory oversight and include operating requirements and emission limitations to safely and effectively treat hazardous contaminants.

- **Hazardous waste landfills with environmental permits.** These landfills have stringent environmental controls in place to manage the migration of PFAS into the environment. Permitted hazardous waste landfills employ the most extensive set of environmental controls (e.g., double liner systems with leachate collection and leak detection) and practices (e.g., extensive record keeping) that are currently available for the containment of PFAS waste.
- **Solid waste landfills with environmental permits that have composite liners, and gas and leachate collection and treatment systems.** Modern municipal solid waste landfills, when constructed with appropriate controls (e.g., liner system, leachate and gas collection and management systems, permits), can also control the migration of PFAS into the environment.
- **Hazardous waste incinerators with environmental permits.** These high temperature incinerators have stringent regulatory controls on temperature and other operating parameters to achieve a 99.99 percent destruction efficiency for other (non-PFAS) organic chemicals, and evidence suggests that a similar destruction efficiency may apply to PFAS-containing materials (see below). Currently, thermal treatment is the only commercially available technology that has the potential capability to destroy PFAS, rather than contain it.

In addition to these four DoD-wide options, the DoD Components are directed to consider onsite hazardous waste storage on a site-specific basis, for storage over ninety days. The DoD Components may also consider underground injection control, on a site-specific basis. Third, the DoD Components, upon notification to OASD(EI&E), may also consider other existing and developing PFAS treatment or destruction technologies that are accepted/permitted by the appropriate State or Federal regulator, *instead of* utilizing hazardous waste incinerators, on a site-specific basis. For example, at one site with a large volume of PFAS-impacted soils, where landfills were not an option in that State, OASD(EI&E) was notified that a State permitted thermal desorption unit would be considered rather than hazardous waste incineration. The DoD Components, when selecting one of the options above for the destruction or disposal of PFAS-containing materials, must continue to make informed decisions consistent with this guidance and the Decision Tree.

2. DoD Implementation of Section 330 of the FY 2020 NDAA

Section 330 of the FY 2020 NDAA requires DoD to ensure that when PFAS-containing materials or AFFF are disposed:

- “(1) all incineration is conducted at a temperature range adequate to break down PFAS chemicals while also ensuring the maximum degree of reduction in emission of PFAS, including elimination of such emissions where achievable;
- (2) all incineration is conducted in accordance with Clean Air Act (42 USC 7401 et seq.), including controlling hydrogen fluoride;

- (3) any materials containing PFAS that are designated for disposal are stored in accordance with the requirement under part 264 of title 40, Code of Federal Regulations; and
- (4) all incineration is conducted at a facility that has been permitted to receive waste regulated under [the Resource Conservation and Recovery Act]³² (42 USC 6921 et seq.).”

This guidance addresses the second, third, and fourth criteria together, followed by the first criterion.

The second criterion in section 330 requires that all incineration of PFAS-containing materials is conducted in accordance with CAA requirements. The third criterion in section 330 requires that PFAS-containing materials stored at hazardous waste combustors prior to incineration be stored in accordance with RCRA requirements. The fourth criterion in section 330 requires that incineration is conducted at a RCRA-permitted hazardous waste facility. **Based upon the review of these three criteria, if a DoD Component chooses to incinerate PFAS-containing materials in its custody, the DoD Component must send those PFAS-containing materials, including AFFF, only to RCRA- and CAA-permitted Hazardous Waste Incinerators (HWIs).** RCRA-permitted HWIs with CAA Title V permits operate under conditions that represent the maximum commercially available destruction efficiencies for PFAS, including the control of hydrogen fluoride and other PICs. Additionally, RCRA- and CAA-permitted HWIs have experience in the proper storage of regulated hazardous wastes and must comply with part 264 of title 40, Code of Federal Regulations, concerning storage of material at their facilities. Therefore, the DoD Components will implement the CAA and RCRA permit and storage criteria in section 330 by ensuring that the HWIs utilized for the incineration of PFAS-containing materials, including AFFF, have valid RCRA and CAA operating permits.

The first criterion in section 330 requires that if DoD sends PFAS-containing materials to incinerators, the incinerators utilize a temperature range adequate to break down PFAS while also minimizing emissions of PFAS. Because the second, third, and fourth criterion in section 330 require incineration at permitted HWIs and because these permitted facilities are required to maintain minimum temperature thresholds, DoD used those minimum thresholds in determining whether it can reasonably conclude that its candidate HWIs will achieve the requirements of the first criterion in section 330.

A. Relevant RCRA and CAA permitting requirements

The regulatory requirements for RCRA- and CAA-permitted HWIs are summarized as follows:

RCRA-permitted HWIs must follow stringent regulatory requirements and are required by EPA to conduct testing to determine a Destruction and Removal Efficiency (DRE). The key factors in achieving a high DRE are time in the incinerator (residence time), high temperature, and turbulence (i.e., mixing). The purpose of DRE testing is to demonstrate that virtually all the molecules of a surrogate compound are destroyed in the incinerator.

³² The Solid Waste Disposal Act of 1965 is commonly referred to as the Resource Conservation and Recovery Act (RCRA), which significantly amended the Solid Waste Disposal Act, in 1976.

temperature (>950 °C) and short residence times (1-3 seconds).”⁴⁰ DoD notes that HWIs employ this two-stage process. This paper also stated that the “general consensus across these lab-scale studies is that even the most stable PFAS (e.g., long-chain sulfonates) desorb at temperatures less than 1000°C, and they are destroyed in the gas phase at temperatures greater than 1000°C.”⁴¹

DoD acknowledges that the studies mentioned above and the EPA guidance identified uncertainties regarding PFAS thermal treatment. According to the EPA guidance:

Key uncertainties include the lack of PFAS-specific information on these facilities. EPA currently has no emission characterizations from these sources when they burn PFAS, and is working to develop measurement methodologies as well as gather information to conclude whether potential [PICs] are adequately controlled. EPA recognizes that PICs are formed (even for nonfluorinated compounds); however, based on the unique characteristics of fluorine combustion chemistry, it needs to be determined whether thermal treatment devices and their associated post-combustion control devices are controlling fluorinated PICs.⁴²

EPA, notwithstanding its general finding that there are uncertainties with PFAS thermal treatment technologies, recognized that there is less uncertainty for the permitted facilities that DoD will use for incineration if other disposal options are not deemed viable. According to EPA, the subset of permitted HWIs “may operate under conditions more conducive to destroying PFAS and controlling related PICs relative to thermal treatment units that do not have both RCRA and CAA permits.”⁴³ EPA also recognized that permitted HWIs “are designed to optimize temperatures, residence times, turbulence, and other parameters” to “maximize organic destruction and minimize the formation of PICs.”⁴⁴ These controls include pollution control devices which can remove hydrogen fluoride and other products of combustion.⁴⁵

⁴⁰ *Id.* at page 5363.

⁴¹ *Id.* at page 5363.

⁴² EPA Interim PFAS Disposal Guidance (Dec. 2020), page 6.

⁴³ EPA Interim PFAS Disposal Guidance (Dec. 2020), page 35.

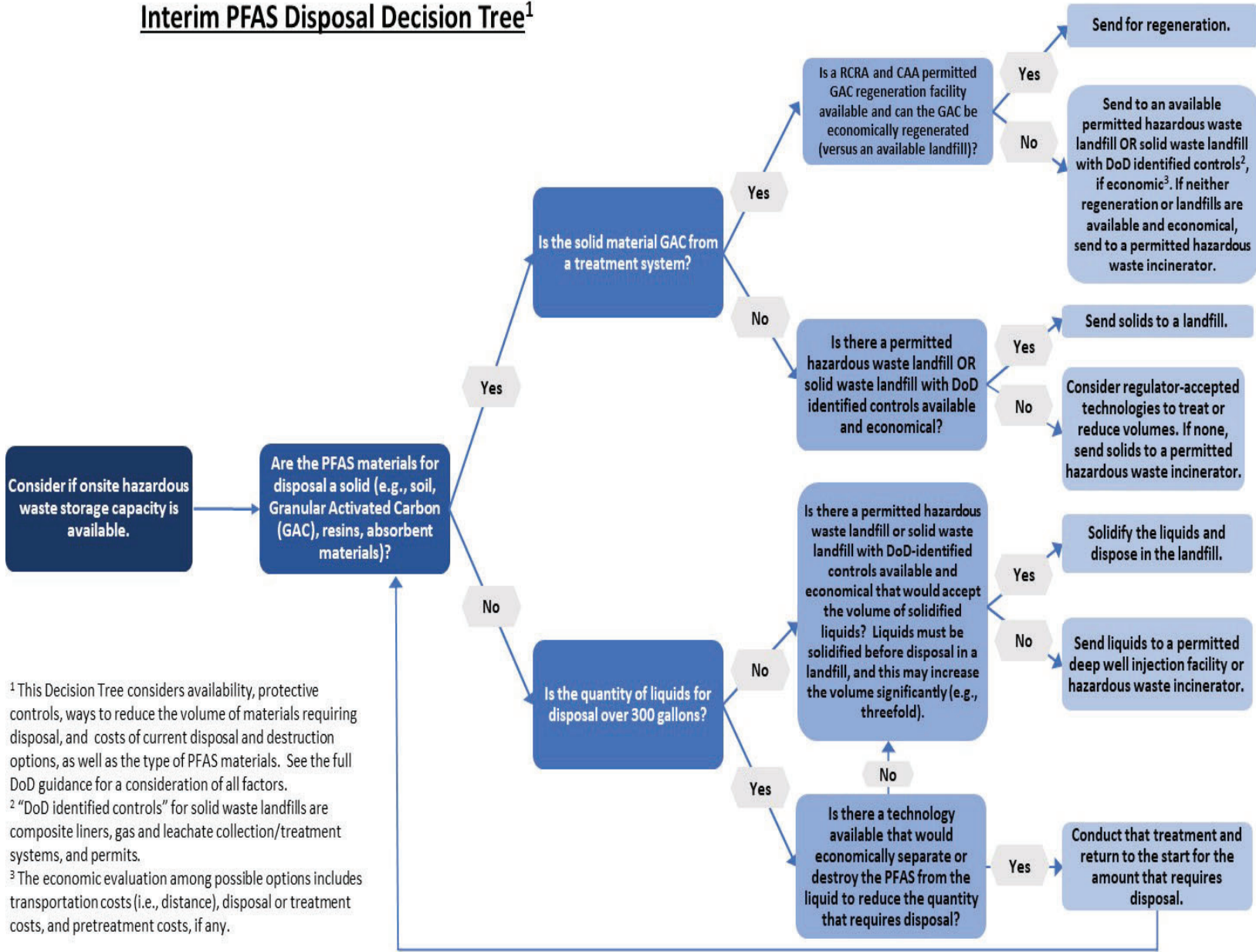
⁴⁴ EPA Interim PFAS Disposal Guidance (Dec. 2020), page 35.

⁴⁵ EPA Interim PFAS Disposal Guidance (Dec. 2020), pages 33-35, 42-43.

3. DoD's Finding

In light of the 2021 PFAS air emission methodology and studies identified above, including at a full-scale RCRA- and CAA-permitted HWI, DoD finds that incineration at these facilities at their permitted temperature range will be adequate to break down detectable PFAS chemicals while also ensuring the maximum degree of reduction in emission of detectable PFAS. Based on the above studies and information that show HWI permits specify a temperature range and other operating parameters to achieve a 99.99% DRE, and HWIs are required to have air emission control devices, RCRA- and CAA permitted HWIs meet section 330's requirements for an adequate temperature range to break down PFAS that currently can be detected in air emissions and meet emission reduction requirements. Additional research is underway, and DoD will update this guidance annually to reflect changes as technologies mature, EPA updates its guidance, and additional data, including air emission detection methods, becomes available.

Interim PFAS Disposal Decision Tree¹



¹ This Decision Tree considers availability, protective controls, ways to reduce the volume of materials requiring disposal, and costs of current disposal and destruction options, as well as the type of PFAS materials. See the full DoD guidance for a consideration of all factors.

² “DoD identified controls” for solid waste landfills are composite liners, gas and leachate collection/treatment systems, and permits.

³ The economic evaluation among possible options includes transportation costs (i.e., distance), disposal or treatment costs, and pretreatment costs, if any.