



CRWI Update December 31, 2020

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Ronald E. Bastian, PE
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PFAS disposal and destruction guidance

The FY 2020 National Defense Authorization Act required EPA to develop an interim guidance document on the disposal and destruction of per- and polyfluoroalkyl substances (PFAS) and PFAS containing materials within one year after the legislation was enacted. EPA released the document on December 18, 2020. Under the legislation, EPA is also required to review and revise, as appropriate, the document every three years. The guidance does not set action levels or clean-up standards. It focuses on the currently available technologies for the disposal and destruction of PFAS containing materials. Storage is not discussed in any great detail. The guidance identifies three options commercially available: landfills, thermal treatment, and underground injection. For solid phase materials, landfill and thermal treatment are the two options. For liquid phase materials, underground injection and thermal treatment are the options. For gas phase material, thermal treatment is the only option listed.

EPA ranked the possible choices based on uncertainties with the technology. Their ranking from least uncertainty to highest uncertainty is as follows:

- a. Interim storage;
- b. Class I deep well injection;
- c. Permitted hazardous waste landfills;
- d. Permitted solid waste landfills;
- e. Hazardous waste combustors (incinerators, cement kilns and LWAKs); and
- f. Other thermal treatment (carbon reactivation units, sewage sludge incinerators, municipal waste incinerators, and thermal oxidizers).

In addition, EPA ranked the technologies on ability to control migration to the environment. The order for this ranking from highest to lowest is:

- a. Hazardous waste combustion;
- b. Hazardous waste or municipal waste landfills; and
- c. Deep well injection.

The Agency states that performance and testing data (DRE for combustors, long-term performance for landfills and deep wells) are insufficient to support more specific guidance at this time. This document is designed as a baseline to be reviewed and updated within the next three years. EPA will consider updating this document in less than three years if research results become available that would allow the Agency to develop more specific guidance.

The statute lists the following types of PFAS containing materials to be considered in the guidance: aqueous film forming foam; soils and biosolids; textiles and other consumer goods treated with PFAS; spent water treatment materials (activated carbon, anion exchange resins and residue from reverse osmosis and nanofiltration); and landfill leachate. The Agency has divided these into solid, liquid, and gas phases materials. The phase of the materials will likely dictate the disposal or destruction method.

EPA identified three technologies that are commercially available and have the potential to destroy or manage the migration of PFAS containing materials.

a. Thermal treatment (commercial incinerators, cement kilns, LWAKs).

These units have regulatory controls to ensure 99.99 DRE for non-PFAS organic chemicals. The guidance states that the information on destruction efficiency on PFAS chemicals is lacking. EPA currently has no emission characterizations from these sources when burning PFAS compounds. EPA is working to develop measurement methods and to gather information on whether potential PICs are controlled. EPA recognizes that PICs are inevitable but want to know if fluorinated PICs are controlled. More research is needed on this issue.

While hazardous waste combustors have been shown to destroy chlorinated and brominated organic chemicals, the strength of the C-F bond is greater than the strength of the C-other halogen bonds. EPA is concerned that higher temperatures and/or longer residence times are needed. In this instance, EPA is defining PFAS destruction as the severing of all C-F bonds resulting in CO₂ and HF.

There is currently a lack of a validated method for reliably identifying and quantifying PFAS compounds as released to the air from a stationary source. EPA plans to release OTM-45 in the near future. This method is based on Method 0010 for semi-volatile PFAS compounds. EPA is working on methods for sampling and analyzing volatile PFAS compounds. These include Tedlar bags, SUMMA canisters, sorbent traps, and cryogenic solvents. In addition, EPA is evaluating FTIR as a suitable technique for CF₄ and C₂F₆ emissions from stationary sources. They are also evaluating SUMMA canisters and sorbent traps for off-line sampling. The Agency is developing a total organic fluoride method but there was little detail on what that might entail. EPA believes the current compliance methods for HF are adequate.

Uncertainties listed in the document on the use of combustion include lack of a standardized validated method for measuring PFAS gaseous emissions and whether combustors are adequately controlling fluorinated PICs.

b. Landfills.

Hazardous waste landfills should be more effective at minimizing PFAS migration than are municipal waste landfills because of the additional controls and monitoring. While landfills might serve as a long-term containment, they have not been designated explicitly for PFAS. PFAS compounds are expected to remain in the landfill for the life of that particular chemical, until the liner or cap fails, or until the material is removed. There are two ways PFAS material can migrate from a landfill: leachate or off-gassing. While a properly designed landfill meeting the requirements for hazardous waste should contain leachate, there is no research on how PFAS wastes will impact the long-term performance of the liners. The most common method for handling leachate is to treat at a waste water treatment plant. These facilities are generally ineffective at destroying PFAS compounds. Other methods for treating PFAS contaminated water (reverse osmosis, ion exchange, etc.) would be needed. Off-gassing is typically controlled at a municipal landfill using some type of combustion source (flare, engine, boiler, etc.). EPA does not have any data on the efficiency of using any of these methods to destroy off-gassed PFAS materials.

PFAS wastes are currently being managed in landfills. It is unclear if these landfills have the controls in place that are effective in managing PFAS discharges and emissions. Some PFAS materials are expected to persist in landfills for years. The report states that to varying degrees hazardous waste and municipal waste landfills are feasible and effective disposal options for PFAS materials. Controls and monitoring for modern units can be effective at preventing migration but management of leachate and landfill gas is required.

c. Underground injection

Underground injection can only be used for liquid PFAS waste. There are six classes of wells regulated by EPA. Class I is subdivided into municipal waste water, radioactive waste, hazardous waste, and non-hazardous industrial waste. These wells are regulated under the Safe Drinking Water Act. They require injection into a deep geological formation with a no-migration showing before receiving a permit. Understanding of the long-term fate and transport properties of PFAS wastes in the injection zone are limited. This creates uncertainty on predicting migration and longevity in the injection zone.

The last chapter details EPA and Department of Defense research to answer some of the questions on management and destruction of PFAS compounds. This includes data needs for the future updates to the document.

On December 22, 2020, EPA publishes a notice of availability for the interim guidance in the *Federal Register*. The Agency will take comments on this document until February 22, 2021. At this time, it is not clear whether EPA will revise the document after considering comments or wait for the three years allowed by the statute to revise the document. A copy of the document can be found at <https://www.epa.gov/pfas/interim-guidance-destroying-and-disposing-certain-pfas-and-pfas-containing-materials-are-not>.

Benefit cost analysis final rule

On December 23, 2020, EPA published a final rule on “Increasing Consistency and Transparency in Considering Benefits and Costs in the Clean Air Act Rulemaking Process.” It became effective on the date of publication. In general, this rule sets up a requirement that all future Clean Air Act (CAA) rules must contain a benefit-cost analysis (BCA) and sets up the process for doing that analysis. This rulemaking was done under Section 301(a) of the CAA that allows the Administrator to promulgate such rules that will allow him to carry out his functions. The rule has three main elements.

- a. It requires EPA to develop a BCA for all future significant proposed and final rules under the CAA not specifically prohibited under statute.
- b. All BCA must use best available scientific information and be in accordance with best practices from economic, engineering, physical, and biological sciences. Current best practices can be found in EPA guidance and OMB Circular A-4. It also requires that risk assessments used to support BCA should follow best practices for risk characterization and assessment.
- c. Each rule must be transparent in the preparation and presentation of BCA results. It sets up a structure for how each BCA is done and how it should be reported.

The rule sets up a new 40 CFR Part 83. The basic idea behind this rule is to require the Agency to be consistent and transparent when developing BCA for Clean Air Act rules.

Section 108(b) financial responsibility requirements

Section 108(b) of CERCLA requires EPA to develop financial responsibility requirements for various industry sectors. On December 2, 2020, EPA published a final rule that decided not to impose financial responsibilities under CERCLA for the electric power generation, transmission, and distribution sector; the petroleum and coal products manufacturing sector; and the chemical manufacturing sector.

EPA civil penalties inflation adjustment

All federal agencies are required to annually adjust their civil penalties based on inflation. On December 23, 2020, EPA published the adjustment for 2021. All EPA civil penalties will be increased by 1.01182. A complete list of the revised civil penalties for EPA can be found in Table 1 of 40 CFR Part 19.4 or in the *Federal Register* notice.

EPA FY 2021 budget

On December 27, 2020, President Trump signed the FY 2021 funding legislation. This gives EPA \$9.24 billion for FY 2021. This is an increase of \$180 million from FY 2020 and \$2.53 billion above the Trump Administration request. This legislation largely retains the policy riders from prior fiscal years but omitted several new riders from the House version. Some of the new riders omitted include language to block EPA from issuing regulations rolling back methane emissions from oil and gas facilities; language seeking to stop the science transparency rule; and language preventing EPA from withdrawing the rules to designate perfluorooctanoic acid and perfluorooctanesulfonic acid as hazardous substances under CERCLA. Congress increased funding for enforcement, PFAS programs, brownfield cleanups, Superfund, and environmental justice programs. The omnibus legislation also included increased funding for the Department of Energy and the National Oceanic and Atmospheric Administration for climate change work.

FY 2021 NDAA

Congress passed the FY 2021 National Defense Authorization Act (NDAA) in early December. The legislation did not contain the requirement that the Department of Defense follow state clean-up standards for PFAS contamination if those requirements were more stringent than federal requirements. In addition, it did not contain the ban on using incineration to destroy PFAS wastes until EPA develops guidance on safe disposal and destruction methods. On December 23, 2020, President Trump vetoed the legislation. The stated reasons for the veto were because it failed to limit liability protection for social media companies and it forced the Department to remove the names of former Confederate leaders from military installations. On December 28, 2020, the House voted to override the veto by a vote of 322 to 87. The Senate is expected to also override the veto on January 1, 2021.

Citizen science

During a recent Environmental Law Institute webinar, several presenters talked about using low cost sensors as a way of organizing local activists, using the sensors to develop their own data on pollution, and a method for pressing authorities to take enforcement action. One of the presenters was a former acting Assistant Administrator for the Office of Water under the Obama Administration. She suggested that data from these sensors should be used in civil suits since the judicial system is designed to weigh the quality of competing data.

Side deals in consent decrees

In May, the Department of Justice, Sierra Club, and DTE Energy agreed on a consent decree to resolve enforcement proceedings against the coal-fired utility. The terms required DTE to limit pollution, undertake a supplemental environmental project to

replace older busses, and pay a \$1.8 million civil penalty. All parties asked the judge to enter the agreement which he did. At the same time, Sierra Club and DTE entered a side deal requiring DTE to spend at least \$2 million on projects decided by a local board and to shut down coal units the company had already decided to close. The Department of Justice objected to this side deal. On December 3, 2020, the federal district judge decided the side deal was a private agreement between Sierra Club and DTE and did not need to be entered into the court. The judge then granted Sierra Club's request to dismiss the case. The Department of Justice under the Trump Administration has been trying to limit supplemental environmental projects and side deals. For now, side deals will be allowed.

Biden cabinet

President-Elect Biden has selected Gina McCarthy to be his domestic climate czar and Michael Regan to be his EPA Administrator. Ms. McCarthy is a former EPA Administrator and is expected to handle the coordination of the Biden domestic climate policy among the various departments (Energy, Agriculture, Interior, EPA, etc.). John Kerry is expected to handle the international aspects of the climate policy. Mr. Regan is currently the Secretary of the North Carolina Department of Environmental Quality. Ms. McCarthy will not need Senate confirmation but Mr. Regan will. It is likely that Mr. Regan's nomination will be sent to the Senate shortly after the January 20, 2021, inauguration. Just how quickly the Senate takes up this and the other nominations is anyone's guess. Much will depend upon the outcome of the two Georgia Senate run-off elections.

CRWI meetings

Our February 17-18, 2021, meeting will be virtual. Please contact CRWI (mel@crwi.org or 703-431-7343) if you have interest in attending.