

Landfill disposal criteria for PFAS-contaminated waste

March 2020

EPA 1125/20: This factsheet is developed to provide direction and guidance for the disposal of PFAS-contaminated waste in landfill facilities.

Introduction

Per- and poly-fluoroalkyl substances (PFAS) are a group of synthetic chemicals that have been extensively used in consumer and industrial products since the 1950s. They were used to manufacture non-stick coatings and products that require resistance to water, heat, fire, stain and weather. Examples include firefighting foams, carpets and waterproof clothing.

PFAS are known to have high thermal, chemical and biological stability. These chemicals are capable of long-range environmental transport through soil and water media. The range of issues associated with PFAS contamination, including the management of PFAS contaminated materials presents a challenge for environmental regulators. To address this challenge, the *PFAS National Environmental Management Plan (PFAS NEMP)*¹ was developed.

The objective of the PFAS NEMP is to provide a clear, effective, coherent and consistent approach to the regulation of PFAS in Australia. Its provisions are broad and wide ranging in order to take into consideration the different policy frameworks that govern the regulation of contaminated materials within each state and territory.

Scope

This factsheet is formulated to outline EPA's position on the landfill management of PFAS-contaminated waste and requirements to put into operation the landfill acceptance criteria under the Landfill Disposal section of the PFAS NEMP.

Legislation

The principal legislation addressing pollution in South Australia is the *Environment Protection Act 1993* (the EP Act)². In particular, section 25 imposes the general environmental duty on all persons undertaking an activity that may pollute to take all reasonable and practicable measures to prevent or minimise any resulting environmental harm.

The *Environment Protection (Water Quality) Policy 2015*³ provides the main legislative framework for the protection of the state's water system. It requires all persons undertaking an activity that may pollute to take all reasonable and practicable

¹ <http://www.environment.gov.au/protection/chemicals-management/pfas>

² <https://www.legislation.sa.gov.au/LZ/C/A/Environment%20Protection%20Act%201993.aspx>

³ [https://www.legislation.sa.gov.au/LZ/C/POL/ENVIRONMENT%20PROTECTION%20\(WATER%20QUALITY\)%20POLICY%202015.aspx](https://www.legislation.sa.gov.au/LZ/C/POL/ENVIRONMENT%20PROTECTION%20(WATER%20QUALITY)%20POLICY%202015.aspx)

measures to prevent or minimise environmental harm which includes a requirement to avoid activating trigger values relevant for waters at a landfill facility.

The *Environment Protection (Waste to Resources) Policy 2010*⁴ is another important legislative framework relevant to the administration of this factsheet. The policy prohibits certain waste types from disposal at a landfill facility. In other cases, biological and/or physical treatment is required for wastes prior to landfill disposal.

Approach to PFAS NEMP Implementation in South Australia

The EPA is developing factsheets to supplement the principles endorsed under the PFAS NEMP in a manner that is consistent with the state’s established guidelines and standards. The factsheets aim to cover PFAS management in areas related to waste disposal, biosolids and wastewater, site contamination and water quality.

In particular, this factsheet summarises the EPA’s position and regulatory approach in implementing the Landfill Disposal section of the PFAS NEMP which outlines the requirements for the disposal of PFAS-contaminated waste. The information below aim to foster better understanding on how to implement the landfill acceptance criteria indicated under the Landfill Disposal section.

EPA’s position and regulatory approach

- 1 Disposal of PFAS-contaminated waste is permitted only in landfills constructed with single composite lining system or double composite lining system. Disposal is not permitted in a clay lined cell.

In the assessment of contaminated waste, PFAS may not be the only contaminant of concern. Other toxicants may be present such as heavy metals, petrogenic hydrocarbons, inorganic substances, organochlorine pesticides and other emerging contaminants. Due to lack of understanding on the collective behaviour when all these contaminants interact together within the landfill, a precautionary approach is adopted to restrict the disposal of PFAS-contaminated waste on composite-lined landfill cells only.

- 2 Treatment is not required prior to landfill disposal provided that both dry weight and leachate disposal criteria are not exceeded.

For single composite lining system, the following landfill acceptance criteria will apply:

Parameter	Dry weight conc. (mg/kg)	Leachate conc. (ug/L)
PFOS + PFHxS	50	0.70
PFOA	50	5.60

For double composite lining system, the following landfill acceptance criteria will apply:

Parameter	Dry weight conc. (mg/kg)	Leachate conc. (ug/L)
PFOS + PFHxS	50	7
PFOA	50	56

If the dry weight concentration exceeds the criteria, there is no necessity to undertake leachate testing as the contaminated waste would not be permitted to be received in the landfill for the purpose of disposal. This material should be subjected to a process (eg heat treatment) that irreversibly transforms PFAS into benign compounds⁵.

If the dry weight concentration does not exceed the criteria but the leachate concentration does, physical and/or chemical treatment of the waste may be considered. The EPA requires a submission of a treatment plan to illustrate the methodology of treating the contaminated waste.

⁴ [https://www.legislation.sa.gov.au/LZ/C/POL/ENVIRONMENT%20PROTECTION%20\(WASTE%20TO%20RESOURCES\)%20POLICY%202010.aspx](https://www.legislation.sa.gov.au/LZ/C/POL/ENVIRONMENT%20PROTECTION%20(WASTE%20TO%20RESOURCES)%20POLICY%202010.aspx)

⁵ Consistent with the requirements under the Stockholm Convention.

- 3 The US EPA Method 1320 (Multiple Extraction Procedure) should be adopted as standard for leachate testing.

This approach is formulated in a manner that aligns with EPA's existing requirements in assessing the transport and mobility of contaminants in a landfill environment.

Publications and standards

The landfill management of PFAS-contaminated waste should be administered in conjunction with relevant EPA guidelines and other standards on soil sampling, storage and stockpiling, waste classification and landfill disposal such as, but not limited to the following:

- [Guidelines on the environmental management of landfill facilities – Solid waste disposal](#)
- [Current criteria for the classification of waste including Industrial and Commercial Waste \(Listed\) and Waste Soil](#)
- [Standard for the production and use of waste derived fill](#)
- [Guideline for stockpile management: Waste and waste derived products for recycling and reuse](#)
- [National Environment Protection Measure \(Assessment of Site Contamination\) 1999](#), National Environment Protection Council (NEPC) 2013.

This will ensure that issues associated with uncontrolled storage and stockpiling⁶, inappropriate sampling regimes, dilution⁷ and improper disposal are prevented.

Landfill operators with current approvals to receive and dispose of chemically contaminated waste are required to submit a process change to the EPA in order to append PFAS-contaminated waste as a new waste stream. New licence conditions will be developed and imposed to capture the following:

- 1 Notification is to be sent to the EPA prior to the receipt and disposal of PFAS-contaminated waste. This includes details on the quantity, source/origin of the waste and test results that confirm compliance to the criteria. If treatment is required prior to waste disposal, a treatment plan should be submitted for approval by the EPA.
- 2 Testing of PFAS in groundwater, surface water and/or leachate should commence at least 12 months prior to the disposal of PFAS-contaminated waste in order to provide baseline information.

Emergence of new scientific knowledge and understanding about PFAS may result to changes in standards and criteria. This position may be subject to periodic review to ensure it aligns with new developments related to the landfill management of PFAS-contaminated waste.

Further information

Legislation

[Online legislation](#) is freely available. Copies of legislation are available for purchase from:

Service SA Government Legislation Outlet
Adelaide Service SA Centre
108 North Terrace
Adelaide SA 5000

Telephone: 13 23 24
Facsimile: (08) 8204 1909

⁶ Further guidance on storage is available in the [PFAS National Environmental Management Plan](#).

⁷ Dilution is the process of combining materials to reduce contamination levels. Components should not be added to the PFAS-contaminated waste for the purpose of diluting the chemical substance where, without dilution, the concentration of the substance will not comply with the landfill acceptance criteria.

Website: <https://service.sa.gov.au/12-legislation>
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General information

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