



19 December 2024

Select Committee on PFAS (per and polyfluoroalkyl substances)
PO Box 6100
Parliament House
Canberra ACT 2600

BY EMAIL PFAS.sen@aph.gov.au

Dear Secretary

Tellus appreciates the opportunity to provide a submission to the Select Committee on PFAS. Given Tellus' experience, expertise and business activities, this submission focuses on the following terms of reference:

(e) the effectiveness of current and proposed federal and state and territory regulatory frameworks, including the adequacy of health based guidance values, public sector resourcing and coordination amongst relevant agencies in preventing, controlling and managing the risks of PFAS to human health and the environment;

(g) international best practices for the environmentally sound management and safe disposal of PFAS;

(k) areas for reform, including legislative, regulatory, public health and other policy measures to prevent, control and manage the risks of PFAS to human health and the environment, including the phasing out of these harmful substances.

Executive Summary

- Tellus supports stringent regulation for the safe management of PFAS pollution, including through state and national regulation guided by international standards.
- Geological repositories provide an environmentally safe (if not superior) waste solution for the problem of PFAS.
- Australia's current regulatory approach, does not fully recognise the safety benefits of geological repositories for PFAS management, limiting the range of options to manage PFAS waste. This risks poorer environmental outcomes for Australians and financial risks for government and industry.
- Environmental regulation should evolve as the market for hazardous waste disposal continues to broaden and newer, safer solutions become available.

About Tellus

Tellus owns and operates Sandy Ridge, a hazardous waste facility in Western Australia. The facility is licensed and equipped to dispose safely of almost all forms of hazardous waste,

including PFAS contaminants, mercury, lead and other heavy metals, naturally occurring radioactive material (NORM), hydrocarbons, and agricultural chemicals. Tellus can accept hazardous waste from anywhere in Australia or its Exclusive Economic Zone.

Located 240km northwest of Kalgoorlie, Sandy Ridge is a near-surface geological repository, a type of facility well-known internationally and acknowledged by the International Atomic Energy Agency as extremely safe for the permanent disposal of low-level radioactive waste. It is also Australia's first (and only) nationwide facility for the permanent disposal of low-level radioactive waste, capable of disposing low-level radioactive waste.

Unlike a conventional landfill, which is open, with an artificial liner that degrades over time, and collects leachate which can pollute groundwater, the Sandy Ridge geological repository uses the natural barriers of the environment to contain waste, supported by an additional engineered barrier – an air dome – which prevents the build-up of leachate during disposal.

Since operations began in 2020, Tellus has, without incident, safely transported for permanent disposal more than 100,000 tonnes of hazardous material, including (since 2023) 6,000 cubic metres of low-level radioactive waste contaminated material (the equivalent of two and a half Olympic swimming pools by volume), and approximately 1,100 sealed sources and ASNO safeguards material from every mainland state and territory in Australia.

Australia's geology is ideal for safe hazardous waste management, including the permanent disposal of radioactive waste. Sandy Ridge is located on the Archean Yilgarn craton where extensive granitic rocks are overlain by surficial kaolin and saprolite formed by in-situ weathering. The environment is arid, with low annual rainfall and high rates of evapotranspiration. The area has been stable for around 2.7 billion years and dry for at least 100 million years, with no underground aquifers present. These geological characteristics mean Sandy Ridge is one of the safest places on earth to permanently dispose of hazardous waste, whether chemical or radioactive.

Sandy Ridge operates with approval from the Western Australia Government and is licensed by the WA Radiological Health Council to permanently dispose of low-level radioactive waste.

Tellus and PFAS

Based on its location and environmental approvals, Sandy Ridge is arguably the safest hazardous waste disposal facility in Australia. It can dispose of large volumes of waste – it will soon be able to dispose of 280,000 tonnes of material annually.

While Tellus has disposed of some PFAS material, including material that originated from government agencies, it has been constrained in disposing of higher volumes by current concentration limits in applicable legislation. Current regulation prevents acceptance of higher concentrations of PFAS contaminants due to the interpretation of the Stockholm Convention in the current National Environmental Management Plan (currently NEMP 2.0), which guides state regulation.

Tellus believes it can play a greater role in supporting government and environmental regulators to address Australia's PFAS challenge with simple changes to regulation. There is

no other facility in Australia that can dispose of PFAS at scale like Sandy Ridge. This attribute means remediation and clean-up projects can be completed at far greater scale and speed than other current solutions.

In 2023, Tellus participated in the consultation process for the review and update of the NEMP being undertaken by the Department of Climate Change, Energy, the Environment and Water (DCEEW) and is looking forward to the government finalising and releasing its response to this process. Our submission suggested changes to the NEMP which better reflect the intention of the Stockholm Convention with respect to specially engineered landfills like geological repositories. We also noted the different approach taken by US government agencies compared with the position in Australia regarding PFAS management.

For the benefit of this Inquiry, this submission is based on the submission Tellus made in 2023.

The NEMP today arguably permits PFAS to be disposed of in landfills, but applicable laws should be clarified when update to include specific reference to geological repositories

Although it is a geological repository, the Sandy Ridge facility is classified as a Class IV (the highest category) landfill under relevant Western Australian environmental regulation.

The Stockholm Convention, which is used as the basis for the NEMP and subsequent state environmental regulation, sets 50mg/kg as a threshold for guiding disposal by landfill. The WA Department of Water and Environmental Regulation (DWER) has advised Tellus that the 50mg/kg PFAS limit for Sandy Ridge is based on the Stockholm Convention limit and is consistent with the EPBC Act and section 14 of the NEMP.

Since it is classified as a landfill, a limit of 50mg/kg of PFAS is applicable for disposal of PFAS-contaminated material at Sandy Ridge. Due to DWER's interpretation of the NEMP, based on the Stockholm Convention, Sandy Ridge is not permitted to take PFAS concentrations above this threshold.

On the face of it, this appears correct. However, the position set out in the Stockholm Convention is more nuanced and is arguably not fully reflected in Australian regulation and/or application of that regulation.

In fact, the Stockholm Convention makes allowance for disposal above this threshold, provided PFAS is managed via 'environmentally sound disposal' (ESM). What the Stockholm Convention effectively says is that below this threshold, ESM is not relevant. Above the threshold, technical guidance documents developed to support the Stockholm Convention set out what constitutes ESM in the management of PFAS waste: geological repositories are included as one of the methods available for use "when destruction or irreversible transformation does not represent the environmentally preferable option."

In seeking consistency with the Stockholm Convention, application of the Australian guidelines has, instead, introduced inconsistency, with the perverse outcome that arguably as good or better environmental outcomes, which could be available for the benefit of Australians, are not being taken advantage of.

This being the case, it is arguable that the Stockholm Convention guidelines, which guide Australian regulation as set out in the NEMP, are not being fully applied. If they were applied in accordance with the purpose of the 50mg/kg limit, there would be, therefore, no need to change the NEMP.

In our submission to DCEEW, we argued that the better view is to clarify NEMP 3.0 and make explicit accommodation for geological repositories. One proposed solution to this is amending the NEMP by returning to wording used in the 2016 Commonwealth guidance, prior to the original NEMP, issued in 2018. The 2016 guidance explicitly referenced “specially engineered landfill” or “permanent storage”, definitions that could include geological repositories:

“When destruction or irreversible transformation does not represent the environmentally preferable option due to environmental or human health impacts, then the PFOS in the contaminated soil or sediment should:

- *be either immobilised or its mobility substantially reduced, for example, using emerging treatment/immobilisation technologies; or*
- *be disposed of in highly secure specially engineered landfill or, when commercially available in Australia, permanent storage in underground mines and formations, consistent with Section IV.G.3 of the Basel Convention’s General technical guidelines on the environmentally sound management of waste consisting of, containing, or contaminated with persistent organic pollutants.”*

The 2018 NEMP removed the second bullet point. Adding this wording back would provide a clearer guide to regulators and industry of the appropriate role of geological repositories in the PFAS remediation challenge. It could be further clarified in related guidance that such facilities are not required to take account of the 50mg/kg threshold, or explicitly stating that geological repositories are an example of ESM and / or landfills where a higher threshold can be safely applied.

In many cases, geological repositories provide a superior solution than thermal destruction for certain PFAS materials

Because of the focus on destruction of PFAS materials in the Stockholm Convention and the NEMP, thermal destruction is a widely used method to treat PFAS contaminated waste, including in Australia.

Tellus commissioned Mr Geoff Latimer¹ of Ascend Waste and Environment to critically analyse several PFAS waste disposal techniques in the Australian marketplace. The result of this work, “Comparison of Australian approaches to PFAS waste management”, is attached as Annexure 1.

Mr Latimer found that:²

- *geological repository rated highest overall for management of the following PFAS*

¹ Geoff Latimer is the Director of Ascend Waste and Environment Pty Ltd. For over 30 years he has specialised in the regulatory interface governing hazardous waste and environmental chemicals in Australia and the Pacific region, from a compliance (private sector) and knowledge development (government) perspective. Geoff has been the primary author of the Hazardous Waste in Australia report series, from its inauguration in 2015 to the most current edition in 2021.

² Page vii, Latimer 2022

contaminated wastes:

- *Aqueous film forming foam (AFF);*
- *Granular activated carbon (GAC);*
- *All contamination levels of soil, but particularly highly PFAS-contaminated soil and co-contaminated soil (PFAS plus significant levels of contamination in asbestos or inorganic chemicals such as heavy metals);*
- *In-situ sorption/separation (pump and treat) techniques and geological repository both rated highest for management of PFAS wastewaters, although the former may be slightly ahead due to the broader environmental benefits of constraining most of the activity onsite; and*
- *Biosolids-specific gasification rated highest for managing biosolids contaminated in PFAS.*

He also noted that “for intermediate to high concentrations of PFAS wastes in particular, geological repository rated significantly higher than all other management options in three of the four measures...” he used to prepare his analysis.³

These findings are illustrated in the table on page vi of Mr Latimer’s report.

Australia’s use of thermal destruction is arguably inconsistent with the position taken by the US EPA and the US Department of Defense

PFAS pollution is an issue of increased prominence in the community. Recent media focus, including in Australia, has highlighted the potential liability of companies like 3M, who historically produced PFAS chemicals, given the impacts of these “forever chemicals” on human health and the natural environment.

It may be argued that landfill disposal is inappropriate, given current guidance and practice about destruction of PFAS materials, for example through thermal destruction. However, as an effective method of destroying PFAS, thermal destruction has been brought into doubt.

The US EPA, in December 2020, issued guidance noting that the use of storage, deep well injection, permitted hazardous waste landfills and solid waste landfills provide a more certain method of safely dealing with PFAS compared with hazardous waste combustors and other thermal treatment.⁴ It has been concerned that it is difficult to monitor thermal destruction technologies to confirm all PFAS material is actually destroyed, and not released into the surrounding air into nearby communities.⁵

In response, the US Department of Defense, which is responding to legal claims arising from unsafe incineration, in April 2022 issued a ban on thermal destruction of PFAS. In contrast, despite these uncertainties, thermal destruction continues to be a valid method of PFAS management in Australia, including in the population-dense Melbourne metropolitan region.

Providing stronger regulatory guidance about the safety of geological repositories is one way this risk can be mitigated in Australia if further research or additional compliance testing is

³ Page vii, Latimer 2022

⁴ Latimer 2022, p13.

⁵ Latimer 2022, p14.

required to provide assurance to the community that no further threats to human health or the natural environment are caused by thermal destruction of PFAS.

Limitations on insurance coverage for PFAS pollution is another risk faced by companies and/or government agencies in their management of PFAS waste, particularly in jurisdictions where the Australian Government has already paid around at least \$330 million in compensation because of class actions⁶. Given the known threats of PFAS waste, to human health, the natural environment, and corporate liability, regulation should support, not stifle, the availability and use of as many safe waste disposal options as exist in the Australian marketplace.

Conclusion

The establishment of the first commercial geological repository in Australia, Tellus' Sandy Ridge facility, has raised the safety standard of what is available for waste disposal in the Australian marketplace.

We argue that environmental regulation should reflect this and that the NEMP 3.0 should be amended to make provision for geological repositories as a preferable form of waste disposal to take account of their unique attributes for disposing of PFAS in an environmentally responsible way.

Yours sincerely

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Managing Director and CEO
Tellus

⁶ Latimer 2023, p17, <https://pfas.australianmap.net/2021-march-212m-pfas-payout-for-property-value-loss-and-distress-but-residents-contamination-fears-linger/>;
<https://www.abc.net.au/news/2023-05-15/pfas-class-action-commonsettlement-reached-with-30-000-claimants/102346274>.