Research Agendas for Legal Protection of Soil in the EU

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Toxic Legacies: Navigating Legal Gaps and Challenges in PFAS ("Forever Chemicals") Regulation for the Future of EU Soil Protection

Ifigeneia Tsakalogianni[1]

Per- and polyfluoroalkyl substances (PFAS, or "Forever Chemicals"), a diverse group of nearly 15,000 synthetic compounds, pose a significant threat to the environment and human health, with an estimated 2.8 million potentially contaminated sites across the EU[2]. Due to their persistence and high mobility, PFAS contaminate soil and groundwater, disperse through drinking and surface water, and accumulate in the food chain[3]. Exposure has been linked to endocrine disruption, carcinogenicity, and hepatotoxicity[4].

This presentation will critically examine the legal and regulatory landscape governing PFAS management in the EU, focusing on soil contamination. To what extent do EU legal and policy instruments—including the EU Soil Strategy for 2030 and the draft EU Soil Monitoring Law—address PFAS pollution in soil? In the absence of a harmonised EU framework, how do national approaches, such as Germany's recommendations for PFAS contamination and Belgium's temporary framework for PFAS-containing soil[5], shape regulatory responses?

The legal dimensions of PFAS "end-of-life" management and soil restoration will also be explored. What legal barriers hinder the adoption of remediation solutions, and how does the law

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[1] Environmental Lawyer, LL.M., MSc, PhD Researcher in Environmental Law, Hasselt University, Belgium, ifigeneia.tsakalogianni@uhasselt.be

[2] COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS, Chemicals Strategy for Sustainability Towards a Toxic- Free Environment, COM/2020/667 final.

[3] M. Lerch, et al., Food simulants and real food – What do we know about the migration of PFAS from paper based food contact materials?, Food Packaging and Shelf Life, Volume 35, 2023, https://doi.org/10.1016/j.fpsl.2022.100992.

[4] S. Li et al. Associations between per-and polyfluoroalkyl substances (PFAS) and county-level cancer incidence between 2016 and 2021 and incident cancer burden attributable to PFAS in drinking water in the United States. J Expo Sci Environ Epidemiol (2025). https://doi.org/10.1038/s41370-024-00742-2.

[5] The temporary framework for PFAS-containing soil materials was published in the Belgian Official Gazette on 10 October 2023 ("*Handelingskader voor hergebruik van PFAS-houdende grond en baggerspecie*", available in Dutch at: https://open.overheid.nl/documenten/dpc-dee421ec8377efafeaf463e5d632d30a7c38b567/pdf).

address PFAS contamination in soil? Furthermore, to what extent has case law established precedents for compensation claims related to PFAS soil pollution?

Ultimately, a legal “cradle-to-grave” assessment of PFAS in soil will be proposed, integrating Circular Economy principles and foundational Environmental Law principles to emphasise prevention, sustainable use and production, and safe disposal. As a harmonised, interdisciplinary legal framework seems necessary, further research should examine the intersection of legal and scientific advancements in PFAS detection and remediation technologies towards a “PFAS phase-out”.