

Thank you for the thorough revisions and for carefully engaging with the reviewers' comments. I have a few additional suggestions to further strengthen the manuscript and clarify several remaining points.

Response to RC1: 'Did you test that it did not leach or adsorb TFA?'

The revised text (Line 143-149) states that 'We blank tested the PE material to exclude any contamination. Because of the strong hydrophilicity of the TFA molecule, we did not consider sorption to the hydrophobic PE'. This can rule out contamination, but it does not demonstrate negligible loss due to sorption/adsorption. And the statement that TFA will not sorb to PE because it is hydrophilic is an assumption and should be presented as such unless supported by data or a specific reference. I think it will be good to clarify explicitly that sorption was assumed negligible and provide a supporting citation if available.

Response to RC2: 'This hints at seasonality in aquifer concentrations. Was this seasonality considered when calculating mass flux of TFA? In other words, was the groundwater discharge weighted with a "constant" groundwater TFA concentration or seasonal values of groundwater TFA concentration?'

The revised text (Appendix H, Lines 683–685) states that 'The mean TFA groundwater concentration error was set to 30% because measurements in the Freiburg drinking water supply indicated seasonal variability, with the same magnitude'. While this acknowledges variability, it does not actually account for seasonality in the groundwater mass-flux calculation. Please state explicitly whether groundwater TFA concentration was treated as constant in the groundwater export term and where this enters the load calculation.

Response to RC2: 'There is a TFA surplus in Dreisam catchment which you attribute to manures. However, could this surplus be from legacy storage of TFA from previous years? Given that 2023 was dry year, the TFA from previous years could have been retained in catchment and subsequently be mobilized in the wet year, 2024.'

The revised text (Line 433-439) states that 'The absence of an export deficit during the preceding dry year contradicts the assumption that the TFA export surplus in 2024 originated from the previous year. Since the surplus might stem from PPP use, discussing potential legacy storage is warranted'. This explanation is not logically compelling. A dry year can still export measurable TFA while simultaneously increasing subsurface storage because reduced hydrologic connectivity can limit flushing. Moreover, PPP-related inputs could contribute in 2023 without producing a clear annual surplus if low discharge and limited connectivity reduce catchment-scale export. Legacy effects may also operate on multi-year timescales and can involve multiple pools (stored

dissolved TFA and/or persistent PPP residues/intermediates that generate TFA with delayed kinetics). Accordingly, please soften the inference that 2023 observations rule out legacy contributions and explicitly acknowledge that the elevated export in 2024 could reflect a combination of hydrologic flushing of previously stored dissolved TFA, and delayed formation and mobilization of TFA from persistent PPP residues and degradation intermediates. Finally, without direct measurements of PPP residues/precursors (or application records), statements such as “supported by our data” appear too strong; “consistent with our observations” would be more appropriate.