



## Proposals for NORMAN Joint Programme of Activities 2024

Title	<b>Intercomparison study on passive sampling and NTA for PFASs</b>
Type of activity	Intercomparison study on passive sampling and NTA for PFASs
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Topic / activities	<p><b>Background / Justification for the proposed activity:</b></p> <p>Per- and polyfluoroalkyl substances are a large group of compounds that have been used in countless industrial, commercial and manufacturing processes and products for decades. Use and waste disposal of PFASs has resulted in wide-spread environmental contamination. Due to the high stability and mobility PFASs have been detected in in all environmental compartments, as well as in humans. Perfluoroalkyl acid (PFAA) precursors can degrade in the environment to form PFAAs, as well as numerous degradation intermediates. Due to the relatively uncontrolled synthetic routes and environmental degradation pathways, thousands of individual anionic, cationic and zwitterionic PFASs are believed to exist. The vast number and diverse properties of PFASs, and the geographical scale of contamination present enormous analytical and sampling challenges. Current sampling, analysis and identification methods are limited to handful of PFASs including sulfonates, sulfonamides, carboxylates, phosphinates and others. Therefore, non-targeted analysis (NTA) is emerging an important tool to characterisation of these compounds and understand their fate in the environment, including degradation and transport processes. Passive sampling is emerging as an important tool for the monitoring and identification of PFAS in waters as they provide <i>in situ</i> concentration of samples, in some cases can increase sensitivity and provide a more representative image of PFAS contamination in comparison to grab sampling due to time-integrative character of sampling. The combination of passive sampling of PFAS and NTA is of high interest for characterising sources and fate of PFAS in the environment and from contaminated source zones. However, inter-laboratory comparisons of the use and interpretation of data with these tools is necessary to increase confidence in their use and application.</p> <p><i>This WG was launched in 2023 with the aim to address and identify some of the limitations and opportunities with the passive sampling and broad scale NTA analysis of PFASs</i></p> <p><b>Description of the proposed activity and expected outcomes for 2024:</b></p> <p><b>In 2023 we begun Phase 1: Intercomparison of analytical methodologies</b></p> <p>One type of passive sampler was deployed at a highly contaminated sites in Australia along with grab sample collection. The site has wastewater effluent and a diverse range of PFAS sources, selected to represent different matrices and PFAS profiles.</p> <p>Homogenised passive sampler and grab sample extracts, along with reference standards and blanks were sent to participating laboratories for analysis in Sep/Oct 2023 and results from the laboratories for Phase one</p>



	<p>are aimed to be submitted by <b>end of January 2024</b>. Report and publication are expected towards Q3-Q4 2024. <b>A total of 27 laboratories from 16 countries have received samples for analysis and reporting.</b></p> <p><b><u>In Phase I, the passive samplers, their deployment extraction and analysis and shipping costs were all provided in-kind by QAEHS, UQ.</u></b></p> <p><b>Phase 2: Intercomparison of passive sampling technologies, JPA 2024</b></p> <p>As several different passive sampler configurations for PFAS are emerging, including legacy samplers such as POCIS, Phase II of this JPA would involve co-deployment of several (3-4) different passive samplers at a surface water or wastewater site in the EU. Site selection will represent a range of PFAS sources and profiles.</p> <p>The aim is to add to data obtained from Phase I of the JPA by additionally examining the (i) how different passive samplers perform for a range of PFAS (ii) examining extraction techniques of each of the labs (as in Phase I the only point of difference examined between the labs is analysis and reporting) and (iii) analysis (i.e. chromatography-mass spectrometry methods). The aim is also to draw conclusions and apply lessons learned from Phase I in this subsequent phase.</p> <p>Homogenised passive sampler extracts and passive sampler devices, along with reference standards and blanks will be sent to participating laboratories for analysis. Participants will analyse sampler extracts as well as conduct passive sampler extractions themselves.</p> <p><b>We anticipate sampler deployments will be done in EU (coordinated by Recetox) and samplers will be sent to participating labs from there to reduce shipping costs.</b></p> <p>Expected outcomes; Deployment of samplers ~ Sep 2024, Oct 2024 homogeneity test of sample extracts for approximately 10 PFAS using target analysis, Nov 2024 distribution of passive samplers to participants, Jan 2025 receive data from participants. Results processing and evaluation expected by during Q2-Q3 2025.</p> <p><b><i>Added value / Link with other NORMAN activities and / or other projects</i></b></p> <p>This project will link to other NORMAN activities including the passive sampling WG as well as WG-1 Prioritisation and potentially the 'interlaboratory comparison of (semi) quantitative LC/HRMS non-targeted screening' WG.</p> <p>Other potential collaborations include links to The European Partnership for the Assessment of Risks from Chemicals (PARC) project i.e. wastewater-based epidemiology project as well as suspect and non-targeted screening projects.</p>
<p><b>Participants</b></p>	<p>The activity will be co-led by QAEHS – Queensland Alliance for Environmental Health Science, The University of Queensland, Australia; RECETOX - Research Centre for Toxic Compounds in the Environment, Czech Republic; University of South Bohemia, Czech Republic; NIVA and; INRAE.</p>
<p><b>Proposed contribution</b></p>	<p>The University of Queensland</p>



<p>Contribution needed from NORMAN Association<sup>1</sup></p>	<p><b>Costs associated with shipping ~10K EU.</b> As in Phase II of the trial shipping of samplers will be performed. In Phase I all shipping costs of analysis vials were covered in-kind by QAEHS. In Phase II, the cost for shipping is anticipated to be significant because in this instance samplers will be sent to participants (not just vials). To try minimise this, in Phase II samplers will be shipped from within the EU.</p>
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<sup>1</sup> Please, provide here a transparent justification of the requested resources and of the in-kind contribution, thereby distinguishing between the costs associated with “person-months” for the organisation, the “travelling costs” for invited speakers and the costs for the logistics (e.g. meals, room rental etc.)