**Title:** A new toxicity testing framework: Interpreting complex PFAS mixtures for ecological risk assessment in *Daphnia magna*

Aqueous film forming foams (AFFF) commonly used in firefighting and on military bases are known to release a mixture of per- and poly- fluoroalkyl substances (PFAS) into the surrounding environment. The current methodology used in standardized toxicity testing cannot adequately evaluate the toxicity of mixtures, therefore, we are conducting modified standardized tests to observe lethal and sublethal toxicity (mortality, growth, reproduction) in *Daphnia magna* exposed to PFOS and a reconstituted PFAS mixture. Our goal is to determine if exposure to a PFAS mixture exhibits a different organismal and molecular-level effect than exposure to a single PFAS compound (perfluorooctane sulfonic acid, PFOS). The single-compound life cycle exposure to PFOS has been performed successfully, and the same modified OECD experimental methods will be applied to the subsequent PFAS mixture exposure. When exposed to aqueous PFOS, overlapping effects on survival and reproduction were observed that would not have been captured by standard acute or chronic toxicity testing parameters. With the development of this new complex mixtures testing framework, we hope to conduct prospective and retrospective risk assessment, reduce animal testing, and produce a new method to screen chemical mixtures that will inform hazard estimations and future remediation.