# A6: Understanding the major sources, pathways and waterway health impacts of chemicals of concern in waterways to inform risk assessments and management interventions

## Objective(s)

To keep a global watching brief on emerging chemicals of concern that pose a potential threat to aquatic ecosystems in the Melbourne Water region and to gather information about the presence of priority chemicals in waterways, likely impacts on environmental values and management options.

## Why this research is important

Every year new chemicals appear in the market for a broad range of products ranging from pharmaceuticals, personal care products, pesticides, persistent organic chemicals, industrial chemicals and degradation products of all these substances. While many of these new products have little impact on the environment, there are many that may impact human or ecological health and are less regulated i.e. new products can emerge in the environment with limited information to determine waterway health risk. In addition, not all chemicals can be measured in the environment. Therefore, decisions are needed to determine which chemicals should be given greatest attention for developing techniques for detecting and measuring their concentrations in the environment based on known chemical properties and emerging studies.

## Contribution to Melbourne Water research priorities

Key Research Area: Water Quality: HWS Performance Objective: RPO-23 The potential impacts of emerging contaminants of concern (CoC) such as microplastics, pesticides and pharmaceuticals, and toxic chemicals are better understood and mechanisms to respond collaboratively developed.

## Achievements to date

- Continued scan of emerging CoCs worldwide, translated into a top 20 list for MW priority
- Continued development of methodology for detecting emerging CoCs with NMI (E.g. 40,000 contaminants screen used in PPB Unseen threats)
- 3 PhD completions and 9 continuations: 4 publications & 3 in review from completed plus 2 on stir bars.

## Approach for Year 3

*Emerging contaminants of concern scan* Continue to conduct scans in international literature, attend key conferences, and collaborate with relevant agencies to update priority lists of 'known' and 'emerging' chemicals of concern for management.

*Semi-Quantitative measures of chemicals*

Our partnership with the National Measurement Institute will continue to develop analytical methods for detection of new chemicals of interest, exploring options to enable quantitative passive sampling of CoCs, to determine viability of time-weighted average concentrations (TWAC) and further investigate 'stir-bars' performance.

Ongoing PhD projects will focus on the risk of emerging CoCs to key environmental values.

## Key outputs for Year 3

- Attend SETAC conferences and relevant workshops to understand latest research
- Review literature on emerging CoCs
- Complete first field and laboratory calibrations of quantitative passive samplers plus Stir Bars
- PhD research

## Expected benefits

- Prioritisation of 'emerging' chemicals of concern to be the focus of future investigations of their presence and ecological impacts across the region
- Informs Melbourne Water's Contaminants Framework that supports Environmental Protection Act General Environmental Duty obligations
- Provide specific information on 'known' chemicals of concern to help prioritisation of pollution management Performance Objectives in next HWS

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