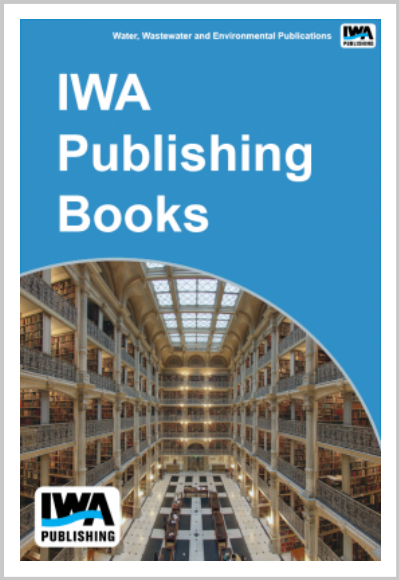
Development of Diagnostic Tools for Trace Organic Compounds and Multiple Stressors



This WERF sponsored research presents a preliminary screening process and ecological diagnostic approaches that could be used to help prioritize and evaluate treated wastewater-influenced sites that may be most at risk from trace organic chemical (TOrC) exposure. This work builds on the TOrC prioritization research completed earlier in this research and demonstrates how current diagnostic approaches used in the U.S. (CADDIS) and Canada (Environmental Effects Monitoring) could be extended to evaluate potential risks due to TOrCs. The screening process uses indicators in four categories: (1) wastewater influent and population served, (2) wastewater treatment characteristics, (3) ecological characteristics of the site, and (4) exposure or effects information from the site if available. The indicators included in the screening process are hypotheses, to be tested further using case studies in this research, and should not be taken as validated measures to be used to infer TOrC issues at a site. The diagnostic approach described in this research could be applied prospectively (could ecological effects due to TOrCs occur at my site?) and retrospectively (I have observed ecological effects at my site; are TOrCs a contributing cause?). However, given our current lack of knowledge concerning modes of action for many TOrCs, as well as the factors that determine whether TOrC effects on individuals are translated to community-level ecological effects, the diagnostic approach in this research focuses on retrospective applications at this time. The screening process has been used with some modification for sites in the Ohio Erie Drift Plain ecoregion and some of these, as well as other sites, will be evaluated using diagnostic approaches in Task 3 (case studies) of this research. A web-based database application (http://werf2.tetratech-ffx.com/ [1]) has been developed for this project to help end users eventually search and evaluate TOrC data collected by many organizations in the U.S. and to assist in screening and diagnosing risks due to TOrCs. Comments are welcome on the various search features and metadata available for TOrCs within the current database.

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