

PRELIMINARY ASSESSMENT OF FLUXES OF PRIORITY POLLUTANTS IN STORMWATER DISCHARGES IN TWO URBAN CATCHMENTS IN LYON, FRANCE

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In urban catchments, diffuse stormwater discharges from both separate and combined sewers contribute significantly to the contamination of water bodies by numerous pollutants, including the priority substances listed in the European Water Framework Directive. Whereas concentrations and loads of traditional pollutants (suspended solids, BOD, COD, nutrients...) in stormwater discharges are well documented, very few information is available on the presence, the concentrations and the loads of priority substances. The objectives of the ESPRIT collaborative project are to identify, evaluate, characterise and later on model the fluxes of priority substances in urban stormwater, for both combined and separate sewer systems.

This paper presents i) the methodology applied to collect representative samples of dry atmospheric deposits, of rainwater and of stormwater discharges at the outlet of experimental catchments, ii) the EMC (Event Mean Concentrations) values and the fluxes of 36 organic substances and of 26 metals calculated for various storm events, and iii) the discussion of these results. Two experimental sites have been selected in Lyon for the project: Ecully (combined sewer system draining a 245 ha residential catchment) and Chassieu (separate stormwater system draining a 185 ha industrial catchment). In total, 26 metals and 36 organic pollutants (in particulate and dissolved phases) are measured in stormwater discharges at the catchment outlets. Metals are analysed by ICP-MS while a multi-residue analytical method is used to quantify 36 organic micro-pollutants in the dissolved phase by GS-MS and LC-FLD-MS/MS.

Since the beginning of 2008, 19 campaigns have been carried at the outlet of both sites, plus 12 campaigns of atmospheric deposits and 20 campaigns of rainwater. 8 organic pollutants in the dissolved phase and almost all metals in both dissolved and particulate phases are detected. The contribution of the atmosphere to the fluxes is significant. A significant variability between the two catchments has been observed, both for metals and for some organics pollutants including pesticides. Inter-event variability is also very significant in each site for concentrations and specific fluxes (i.e. per active ha), indicating that long term campaigns are necessary to reliably evaluate annual fluxes. The paper will present and discuss the results with more details.

Keywords: WFD, priority pollutants, stormwater, sewer systems, atmospheric deposition