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Dynamics of emerging organic pollutants from a municipal landfill

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In large cities, municipal landfills may have received waste coming from hospitals, but also green waste. The corresponding anthroposol might thus be a source of organic emerging substances such as pharmaceutical or phytosanitary substances. The occurrence and fate of organic emerging substances from such a former landfill in urban areas has been studied as part of a research program dealing with the observation and the monitoring of the environment. Of the 261 substances sought (30 pharmaceutical molecules, 223 phytosanitary products and 8 other emerging substances), 11 pharmaceutical molecules in particular have been quantified in the leachates, 2 endocrine disruptors (bisphenol A and triclosan) and 10 phytosanitary substances. Most of these substances are found also in groundwater immediately downstream of the site (including carbamazepine) at concentrations ranging between 0.1 μg/l and 10 μg/l. The number of detected substances appears much smaller a few hundred meters far from the landfill (bisphenol A and diclofenac in particularly, with concentrations ranging from 0.1 to 1 μg/l and about 0.1 μg/l respectively). Natural attenuation occurs during transfer in the plume, as observed for PAHs or metals. Several mechanisms may explain the natural attenuation of the substances.