

The organic micropollutants, including pesticides and pharmaceutical residues are increasingly being identified in the aquatic environment due to the development of analytical technologies with low detection limits (on the level of $\mu\text{g/l}$ or ng/l). The source of pesticides in the environment is agriculture. The pesticides used for plant growth support, if flushing by precipitation, can cause pollution of the environment including surface water and groundwater. Other emerging contaminants in surface water are pharmaceuticals and their metabolites. Some pharmaceuticals appear in aquatic systems because conventional wastewater treatment processes do not remove them and as consequence are present in wastewater discharged to surface water. The main goal of the proposed project is to investigate the occurrence and behaviour of organic micropollutants (pesticides and pharmaceuticals) in groundwater occurring in the aquifers characterized by a very high vulnerability to pollution from surface water. For this investigation, three sites were chosen (including one for more detailed investigation). The chosen well fields (Śrem, Gorzów Wielkopolski and Oborniki) are recharged by bank filtration from the surface water in different degree (from $\sim 50\%$ to more than 80%) and are composed by wells located at a different distance (causing different travel time) from source river water. This situation enables to track of organic micropollutants in different conditions. The interpretation of the results will be supported by a mathematical groundwater flow model (constructed for one selected site), enabling the assessment of travel time from contamination source to wells. The model will also calculate water balance and participation of contaminated groundwater in the total water balance in wells.

According to the literature, organic micropollutants are recognized in surface water, there are also publications presenting an investigation of organic micropollutants in the environment in the context of methodology of measurement without insight into environmental factors. Some works document micropollutants migration in groundwater systems highly depending on surface water quality, for example, at riverbank filtration sites. However, the investigation of organic micropollutants in groundwater is relatively sparse. In case of successful study, this gives a significant opportunity to publish the results in renowned journals. It is assumed that results obtained will be important primarily in the context of fundamental research and applied science. Obtained results will allow to develop guidelines related to groundwater protection (e.g. well-field protection zones documenting) and formulate prognosis of groundwater quality changes due to contamination (in the context of organic micropollutants influence).