

NVT Risk Assessment: Understanding chemical micro-pollutants in water

On the fourth of October the section Risk Assessment organized a symposium on chemical micro-pollutants in water. The symposium was the first face-to-face only meeting of the section Risk Assessment since the Corona pandemic. Around 30 participants attended the meeting, which was held at KWR Water Research Institute (KWR) in Nieuwegein. Annette Wilschut was the chair of the meeting and thanked KWR for hosting this meeting and providing the very timely topic. The meeting consisted of three presentations and a serious game.

Freshwater is a finite resource, and this is realized more in the recent decennia, especially by the new generation. Over the years the perception of the most pressing issues in water management changed to the current awareness of water quality and availability. KWR is the independent research organization in the drinking water sector and is concerned with water research in the broad sense. The core work is part of the Joint Research Programme with the water companies. There are threats towards the quality of the drinking water sources, which is most pressing in surface water. Another activity by KWR is wastewater monitoring and sewer surveillance, to detect drug use and virus particles amongst others. Threats to drinking water sources can be point or diffuse emissions of anthropogenic chemicals. For emerging contaminants there is a signaling value of 0.1 µg/l, to prioritize the most important substances for further research. In addition to the legal limits, there are health-based guidance values, based generally on 20% of the tolerable daily intake. The TTC approach is used to further prioritize substances, as well as QSARs and read-across, with preferably multiple models applied in parallel. Effect based monitoring is also used as a method to assess water quality, such as using Daphnia, Ames test, CALUX. Innovative chemical screening is used to find substances and prioritize them on expected toxicity. Overall, currently innovative approaches are required for hazard and risk assessment. More information can be found in the KWR online library (library.kwrwater.nl).

The next presentation was by Julia Hartmann from RIVM and she told more about the RIVM and its activities related to drinking water quality. RIVM is owned by the ministry of VWS, but is an independent research organization. The scope of the organization is very broad, including many topics related to environmental and human health. The drinking water related activities lie in development of guideline values, emergency response, and research into new challenges, amongst others. Some further information can be found at <https://www.rivm.nl/drinkwater>. From source to tap there are a lot of parties involved with different responsibilities. The presentation contains a figure with an overview of these responsibilities. The proposals for limits by RIVM are based on exposure and health effect information, which go to the ministry of I&W for the actual setting and implementation. The responsibility for the water quality is spread over several stakeholders and regulations, both national and on EU level. In addition to health-related values for substances, there are signaling values for substances without limits of 1 µg/l in drinking water or 0.1 µg/l (long term presence in surface water used for the production of drinking water). Julia's PhD project (PS-Drink) focused on early identification and assessment of emerging chemical and microbial drinking water contaminants. An integrated approach was developed for this purpose, which included a decision support tool based on the concept of value-focused thinking. The goal was to develop a tool to prioritize components for further action (e.g. monitoring). The model provides the expected risk and the uncertainty. For more information on the prioritization model see [this article](#). The thesis can be found [here](#).

The third presentation given by Robert Overhof of Sitech addressed the activities performed to prepare for a new permit for the wastewater treatment plant of the chemical site Chemelot, which is very close to the production site and next to the river Meuse (Maas). The plant collects all the

water from Chemelot site. The preparations for the permit involved a lot of stakeholders, including the local water companies, Rijkswaterstaat, province and companies at the chemical site. Due to tighter regulation for permits, all substances have to be assessed, also those coming into the treatment plant (partially in analytics and mass balance as the composition of some products is kept secret). Assessments consider information on degradation, ecotox, chemical properties and grouping into categories which determines the effort necessary for reduction in discharge. The policy for SVHC is (in principle) zero discharge, which is achieved by maximizing removal and evaluation via discharge tests. Also included in the assessment of the discharge are the background levels, dilution factors and environmental standards. Data availability is an issue: MSDS, ECHA, ECOTOX, QSARs, literature are used to fill the gaps. If there are no standards available, Sitech has to derive indicative standards and make them available. This also requires quite some explaining to companies, who have to cooperate on providing the substance information. The whole assessment also included Whole Effluent Assessment (WEA) and Continuous Biomonitoring with mussels. To note is that for any change in use or production at the companies at the chemical site, the whole process of chemical substance evaluation should be reconsidered. Deriving the standards also requires laboratory capacity and as well as experts and approval. Much more is required under the new permit system, but this also results in more substance specific standards. A hot item at this moment is micro-plastics.



“Tessa Pronk explaining the serious game”

After the break the serious game was introduced by Tessa Pronk and Adele Ferrario. In the game the participants were divided in groups and given the role of a commission that has to suggest a solution to an acute river pollution incident. Each group was provided with a budget and could buy analytical results or hire other experts, decisions had to be made wisely. We learned about all the complicated steps involved in water quality management, finding the cause (hazard assessment, analysis with bioassays) and the solution. Interesting tools can be found at <https://www.sleutelfactortoxiciteit.nl/>

Quotes from the audience and pictures:



“it was fun to work together in a group to solve the issue”



“it was a successful afternoon”