Implementing a protocol for selection and prioritisation of organic contaminants in the drinking water value chain: Case study of Rand Water, South Africa

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Abstract

Approaches that prioritise chemicals according to their importance as environmental contaminants have been developed by government agencies and private industries. However, it has been noticed that few approaches, such as one published by the United States Environmental Protection Agency (USEPA), address the needs of the drinking water industry. There is also no generic approach to the selection, prioritisation and monitoring of organic contaminants in the drinking water value chain. To safeguard drinking water industry customers, it was necessary to develop a generic protocol to assist with the identification of a list of organic contaminants for monitoring in the drinking water value chain. Once the protocol was developed, it was validated in a prototype drinking water value chain. This paper describes the implementation of such a generic protocol. The exercise comprised of testing each step of the protocol, from selection of the 'pool of organic contaminants' (Step I) to recommending the final priority list of organic contaminants (Step VII). Successful implementation of the protocol took place in the Rand Water (South Africa) drinking water value chain (from catchment to tap). Expert judgment was emphasized during the implementation as each step was validated and the opinion of key stakeholders used to shape the process. The tailor-made prioritisation criteria, reflecting the drinking water industry perspective, proved to be successful in selecting and prioritising organic contaminants for monitoring in the drinking water value chain. The organic contaminants were successfully prioritised in 3 classes: short-term priority for analysis, medium-term priority for analysis and long-term priority for analysis. This is a very important guide to assist water utilities in optimising their resources while not compromising the role of public health protection. Finally, a priority list of organic contaminants was identified for use by Rand Water and other water utilities.

Keywords: generic protocol, organic contaminants, validation, selection and prioritisation, drinking water value chain, expert judgment