GROUNDWATER MONITORING WITHIN WSP IMPLEMENTATION IN VENETO REGION, ITALY

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Abstract

Identifying substances that may represent a danger, based on their chemical-physical-toxicological profile, but which have not yet been monitored and which can reasonably be present in the territory due to specific, often not very evident, explicit and difficult to trace, industrial processes is a complex but fundamental exercise within the implementation of a WSP, in particular if the chemical compounds and ingredients are renewed very quickly according to production needs and technological improvements.

Keywords: Drinking Water Monitoring, Groundwater contamination, PMOC, Water Safety Plan (WSP).

1. CHARACTERIZATION THE GROUNDWATER QUALITY

The identification of compounds and parameters (especially if not yet regulated) subject to attention, represents an essential and undelayable prodromal activity for the definition of a coherent and evidence-based monitoring plan (fit-for-purpose). As part of the WSP for Vicenza, RIVE (the research centre of Water Utility VIACQUA) together with Regional Environmental (ARPAV, Water Quality Dept) and Health (ULSS7-8) Authorities is implementing a state-of-the-art monitoring campaign to characterize the quality of groundwaters impacted by discharges from the industrial and agricultural compartments, potentially releasing both known and unknown compounds of high concern for human health. Two actions are currently being implemented: the first consists in the monitoring of more than 300 “known” compounds (including PFAS, PAH, pesticides, volatile compounds, bisphenol, antibiotics active ingredients,

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virus, bacteria, molds, protozoa, caffeine, microplastics, etc.) in more than 50 deep boreholes and sources distributed in the aquifer recharge area.

2. DEVELOPMENT THE STATE-OF-THE-ART MONITORING METHODOLOGY

The second action intends to develop a state-of-the-art methodology to tailor the water monitoring exercises by correlating specific and local industrial production patterns to classes of chemicals of concern, using available industrial classification registers, and large-scale regulations and databases, such as the Italian Register of Production Classification (ATECO), REACH and NormanNet. The results obtained from the extraordinary monitoring attest to a generally good qualitative state of health of the aquifer, except for some hotspots, some known and for which adequate control measures have already been adopted, alongside others of new identification on which in-depth studies are being carried out specific.

Regarding the identification of (unknown and unmonitored) chemicals of concern based on local industrial production patterns, a very short list of 22 hazard chemicals was extracted above according to their chemical-physical properties shaping their hazard level (being very Persistent and very Mobile – vPvM) as well as the availability of analytical methods (being included into the Norman Net database). These chemicals, previously not included in any monitoring performed in the past, will be included into the routine groundwater monitoring operations implemented by the Water Utilities and Environmental Authorities in the framework of Water Safety Plans.