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Extended Abstracts

Editors:
Andrzej Zuber
Jarosław Kania
Ewa Kmiecik

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title: **Uncertainty involved in sampling process and its influence on the overall performance of groundwater quality monitoring**

author(s): **Ewa Kmiecik**
AGH University of Science and Technology, Poland, ewa.kmiecik@agh.edu.pl

Adam Postawa
AGH University of Science and Technology, Poland, adam.postawa@agh.edu.pl

Katarzyna Wątor
AGH University of Science and Technology, Poland, katarzyna.wator@agh.edu.pl

Małgorzata Drzymała
AGH University of Science and Technology, Poland, malgorzata.drzymala@agh.edu.pl

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The most important European Union directives concerning groundwater quality – 2000/60/WE (Water Framework Directives) and 2006/118/WE – say that uncertainty identification and estimation is an important part of the overall groundwater monitoring results interpretation. Uncertainty is the most important parameter describing measurement quality. Also other international standards, e.g. PN-EN ISO/IEC 17025, show that we have to consider all sources of uncertainty rising during different part of procedure, starting from sampling procedure, sampling collection, preservation and transport to laboratory and sample analysis.

Uncertainty assessment procedures have been concentrated only on analysis yet. But many different researches prove that sampling process is very often important source of uncertainty influencing final result and general quality of results achieved during water quality monitoring. The part of uncertainty associated with sampling process can account for 50–90 percent of total uncertainty. Acquaintance of different source and cause of uncertainty growing during sampling process is very important when we want to obtain reasonable results of our investigations. We cannot discount any contribution in total uncertainty.

The best way to achieve satisfying (low) level of uncertainty is to carry on extended quality assurance/quality control (QA/QC) program. During this quality process control samples are collected: duplicate and blank samples. The number of these control samples shouldn't be less than 10% of all normal samples. The analysis of duplicate samples gives us information about uncertainty associated with sampling and analytical process. The analysis of field blank samples says about practical limit of detection for all analysed elements and compounds. The good laboratory practice and properly performed QA/QC program can decrease total uncertainty value and identify main sources of uncertainty. This the most important in the case of sampling which has usually the largest contribution of total uncertainty. The knowledge of uncertainty sources let us minimize its influence and eliminate the biggest contributions by refining whole sampling procedure and source of errors elimination.

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