

Effect of the extent of well purging on laboratory parameters of groundwater samples

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Chemicals reaching groundwater cause water quality deterioration. Reconnaissance and remediation demands high financial and human resources. Groundwater samples are important sources of information. Representativity of these samples is fundamental to decision making. According to relevant literature the way of sampling and the sampling equipment can affect laboratory concentrations measured in samples. Detailed and systematic research on this field is missing from even international literature.

Groundwater sampling procedures are regulated worldwide. Regulations describe how to sample a groundwater monitoring well. The most common element in these regulations is well purging prior to sampling. The aim of purging the well is to avoid taking the sample from the stagnant water instead of from formation water. The stagnant water forms inside and around the well because the well casing provides direct contact with the atmosphere, changing the physico-chemical composition of the well water. Sample from the stagnant water is not representative of the formation water.

Regulations regarding the extent of the purging are different. Purging is mostly defined as multiply (3-5) well volumes, and/or reaching stabilization of some purged water parameters (pH, specific conductivity, etc.). There are hints for sampling without purging. To define the necessary extent of the purging repeated pumping is conducted, triplicate samples are taken at the beginning of purging, at one, two and three times well volumes and at parameter stabilization. Triplicate samples are the means to account for laboratory errors. The subsurface is not static, the test is repeated 10 times. Up to now three tests were completed.