

GEOELECTRICAL LONG TERM MONITORING OF SALT TRACER MOVEMENTS

R. Hoffmann (1) and P. Dietrich (1)

(1) Applied Geology, University of Tuebingen, Sigwartstr. 10, D-72076 Tuebingen, Germany .

`ruth.hoffmann@uni-tuebingen.de`

Success and costs of remediation methods in heterogeneous, contaminated aquifers strongly depend on the quality of knowledge about groundwater flow direction. Hydrogeological approaches, like the determination of pressure gradients in groundwater wells or natural gradient tracer tests can only give local information about groundwater flow direction but often fail to detect important heterogeneities and natural drainage systems - and become extremely uncertain or extremely expensive over long distances. Geoelectrical monitoring of salt tracer movements has turned out to be a powerful tool in the field of short distance flow direction investigations. Refined and further developed, the method will be applicable over distances of several decameters and monitoring times of several months. Preparatory work has to be done though: with increasing distance, increasing dispersion and dilution of the tracer and therefore lower conductivity changes during the passage of the salt, it becomes extremely important to evaluate natural influences on the measurements, like temperature, soil humidity or groundwater level changes. Also, groundwater modeling will be necessary to estimate the amount of tracer needed to reach a certain level of conductivity change. These approaches will be discussed and compared to results of a few smaller tracer tests.