



Methodology of determining soil structure in important groundwater areas: case studies in Kauvonkangas, Finnish Lapland

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Finland is fully self-sufficient in clean groundwater and even has a capacity of exportation. There are approx. 6000 groundwater areas with a total yield of 5.4 million m³/day. Currently only 10% of this groundwater resource is in use. For the efficient and safe exploitation of these areas in the future, detailed modeling of soil structure is an important method in groundwater surveys. 3D -models improve the general knowledge of linkage between land use planning and groundwater protection. Results can be used as a base information in water supply service development and when performing the measures needed in case of environmental accidents. Also, when creating the groundwater flow models the collected information is utilized and is usually the main data source.

Geological Survey of Finland has carried out soil structure studies in co-operation with authorities, municipalities and the local water suppliers. The main objectives of these projects are to determine the geological structure of groundwater area for estimating the validity of the present exclusion area, the quantity of ground water volume and recharge capability and possible risks to the groundwater. Research areas are usually under an active water supply service.

Kauvonkangas groundwater area is located in the municipality of Tervola, in Southern part of Finnish Lapland. Extent of the area is 7.9 km² and it is an important water source for the local and nearby population centers. There are two active water supply companies in the area. Field studies in the project will include general geological and hydrological mapping, soil drilling with observation pipe installation, test pumping and water sampling. Geophysical measures will play a key-role, including ground penetrating radar (GPR) and gravimetric measurements. Studies will be carried out in spring and summer 2016. The main results will be the models of the bedrock and groundwater level and main characteristics of the soil layers in the area. Results will also include the main flow directions of the groundwater. Structure models will be done with Groundhog -software.

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