



Method for layer dependent evaluation of the ground heat conductivity

Markus Proell

Bavarian Center for Applied Energy Research (ZAE Bayern) Division 1: Technology for Energy Systems and Renewable Energies Walther-Meissner-Str. 6, D-85748 Garching, Germany, Tel: +49-(0)89-329442-81, Fax: +49-(0)89-329442-23, e-mail: proell@muc.zae-bayern.de

The method of Geothermal Response Testing as in-situ measurement on vertical ground heat exchanger is well established in Germany since its introduction in 1999. Due to the precise determination of the ground thermal conductivity and thermal parameters of the borehole, it is essential for a correct system design later on.

Within the context of the research project “Quality control on ground heat exchangers”, founded by the Germany Federal Ministry of Economics and Technology, a measurement and evaluation technique for the layer dependent determination of the ground heat conductivity shall be presented. The method provides a more reliable result for the design process and enables the identification of water-bearing formations.

The method was validated on several, geologically well explored, ground heat exchangers of different geologies, which have been drilled especially for research purposes.

The combination of a conventional Geothermal Response Test with heat injection and the measurement of temperature profiles, before and after the heat pulse, allows the evaluation of layer dependent thermal properties, using an appropriate numerical model. The results matched with those of the conventional test of the ground surface level and the detailed layer profiles of the core drillings.