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Thermal use of shallow groundwater - KIT

With the advent of intensive shallow geothermal energy use, a vivid discussion of the ecological as well as economic sustainability of the intensive thermal use of the shallow subsurface has arisen. Since groundwater represents the major source of drinking water in many European countries (Margat and van der Gun 2013), there is regulatory concern for any negative effects in regards to ...

On the thermal effects of three?dimensional groundwater ...

spectrum of sustainable thermal use of the shallow groundwater and subsurface. Subsequently, different de?nitions of sustainabil-ity are discussed, and then a possible policy framework is devel-oped that is based on the precautionary principle. Finally, recommendations for a legal policy are deduced. 2. De?nition of sustainability

Thermal Use of Shallow Groundwater - E-bok - Fritz ...

Get this from a library! Thermal use of shallow groundwater. [Fritz Stauffer; Peter Bayer; Philipp Blum; Nelson Molina Giraldo; Wolfgang Kinzelbach] -- "Preface The thermal use of the shallow subsurface is increasingly promoted and implemented as one of many promising measures for saving energy. The energy extracted from such systems is referred to ...

Thermal conductivity characterisation of shallow ground ...

The uniformity of surface heat flow values determined from a series of shallow boreholes in an advectively disturbed regime will depend on the location of the measurement sites relative to the hinge line separating areas of groundwater recharge and discharge and on the extent of the region centered about the hinge line where fluid inflow/outflow rates are insufficient to perturb the thermal field.

Thermal Use of Shallow Groundwater - MATLAB & Simulink Books

Zugehörige Institution(en) am KIT: Institut für Angewandte Geowissenschaften (AGW) Publikationstyp: Buch: Publikationsjahr: 2013: Sprache: Englisch : Identifikator

Thermal Use of Shallow Groundwater

Thermal Use of Shallow Groundwater introduces the theoretical fundamentals of heat transport in groundwater systems and discusses the essential thermal properties.It presents a complete overview of analytical and numerical subsurface heat transport

modeling and includes mathematical tools and simulation models based on analytical and numerical solutions of the heat transport equation.

Thermal Use of Shallow Groundwater | Taylor & Francis Group

The thermal use of the shallow subsurface is increasingly being promoted and implemented as one of many promising measures for saving energy. A series of questions arises concerning the design and management of underground and groundwater heat extraction systems, such as the sharing of the thermal resource and the assessment of its long-term potential.

On the thermal effects of groundwater flow: 1. Regional ...

SHALLOW GEOTHERMAL ENERGY DEFINITION. According to the Spanish National Geothermal Platform , shallow geothermal energy is defined as the energy stored as heat in the first 250 m below the surface.The associated geothermal energy

resources are considered to rely on the temperature of the solid phase of the geological media and the groundwater within, showing temperatures below 30 °C, and ...

Thermal Use of Shallow Groundwater - Fritz Stauffer, Peter ...

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Thermal Use Of Shallow Groundwater

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Numerical solutions | Thermal Use of Shallow Groundwater ...

Numerical solutions of the equations of fluid flow and heat transport are used to quantify the effects of groundwater flow on the subsurface thermal regime. ... Fundamentals, Thermal Use of Shallow Groundwater, 10.1201/b16239, (37-100), (2013). Crossref.

Sustainability and policy for the thermal use of shallow ...

Thermal use of the shallow subsurface for heat generation, ... Potential negative effects on the soil and groundwater due to an intensive thermal use of the shallow subsurface as well as the extent of potential system interaction still remain unknown. Citing Literature. Volume 53, Issue 3. May/June 2015. Pages 356-361.

Thermal use of shallow groundwater (eBook, 2014) [WorldCat ...

Thermal Use of Shallow Groundwater. DOI link for Thermal Use of Shallow Groundwater. Thermal Use of Shallow Groundwater book. By Fritz Stauffer, Peter Bayer, Philipp Blum, Nelson Molina Giraldo, Wolfgang Kinzelbach. Edition 1st Edition . First Published 2013 . eBook Published 12 December 2013 .

Thermal Use of Shallow Groundwater | Fritz Stauffer, Peter ...

GWT, for example, is significantly altered by the use of shallow geothermal energy systems such as groundwater heat pumps (Stauffer et al., 2013) as well as reinjection of thermal waste water and ...

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implemented as one of many promising measures for saving energy. A series of questions arises concerning the design and management of underground and groundwater heat extraction systems, such as the sharing of the thermal resource and the assessment of its long-term potential. For the proper design of thermal systems ...

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Thermal Use of Shallow Groundwater The thermal use of shallow subsurface is increasingly promoted and implemented as one of many environmentally friendly technologies. Theoretical background of heat transport in the subsurface is introduced and the essential thermal properties are discussed.

Sustainable Intensive Thermal Use of the Shallow ...

An estimation of the installed thermal power and thermal energy use for shallow geothermal energy at the end of 2019 was 77,547 MWt and 599,981 TJ·yr ?1,

respectively . The steady increase of installations evidences the success of this emergent technology but, at the same time, poses some potential sustainability issues related to massive development of systems in urban areas.

Current Legal Framework on Shallow Geothermal Energy Use ...

Thermal conductivity is an important physical property of geological formations. For example, a comprehensive assessment of the thermal conductivity variations in the shallow ground surrounding a heat exchanger borehole can be used to determine the installation parameters of a ground-source heat pump.

Monitoring the impact of intensive shallow geothermal ...

The thermal use of the shallow subsurface is increasingly being promoted and implemented as one of many promising measures for saving energy. A series of questions arises concerning the design and management of underground and

groundwater heat extraction systems, such as the sharing of the thermal resource and the assessment of its long-term potent

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