

EGU22-12929

<https://doi.org/10.5194/egusphere-egu22-12929>

EGU General Assembly 2022

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



## Exploration of high temperature aquifer thermal energy storage in Delft (The Netherlands)

**Philip Vardon**<sup>1</sup>, Martin Bloemendal<sup>2</sup>, Stijn Beernink<sup>3</sup>, Niels Hartog<sup>4</sup>, Auke Barnhoorn<sup>5</sup>, Tobias Schmiedel<sup>6</sup>, Hemmo Abels<sup>7</sup>, and Susanne Laumann<sup>8</sup>

<sup>1</sup>Department of Geoscience and Engineering, Delft University of Technology, Delft, Netherlands (p.j.vardon@tudelft.nl)

<sup>2</sup>Department of Water Management, Delft University of Technology / KWR Water Research, Nieuwegein, The Netherlands (J.M.Bloemendal@tudelft.nl)

<sup>3</sup>Department of Geoscience and Engineering, Delft University of Technology / KWR Water Research, Nieuwegein, The Netherlands (S.T.W.Beernink@tudelft.nl)

<sup>4</sup>KWR Water Research, Nieuwegein, The Netherlands (Niels.Hartog@kwrwater.nl)

<sup>5</sup>Department of Geoscience and Engineering, Delft University of Technology (Auke.Barnhoorn@tudelft.nl)

<sup>6</sup>Department of Geoscience and Engineering, Delft University of Technology (T.Schmiedel@tudelft.nl)

<sup>7</sup>Department of Geoscience and Engineering, Delft University of Technology (H.A.Abels@tudelft.nl)

<sup>8</sup>Department of Geoscience and Engineering, Delft University of Technology (S.J.Laumann@tudelft.nl)

In conjunction with a deep geothermal project which is being implemented on the TU Delft campus in the Netherlands, a high temperature aquifer thermal energy storage (HT-ATES) is being considered. An initial feasibility study suggests that this could significantly reduce CO<sub>2</sub> emissions from heating and be financially beneficial. As part of the research associated with the implementation of the geothermal well, a 500 m deep monitoring and exploration well has been drilled to further investigate two target layers for HT-ATES and to allow for scientific records before, during and after the production phase of the geothermal project. With this drilling, the potential for HT-ATES of multiple layers is investigated by means of innovative exploration methods. An extensive set of downhole geophysical logging tools was used, many cores from both consolidated and unconsolidated layers were taken and a pumping test was carried out in the deepest layer. This work presents an initial overview of the work carried out and provides insights into the initial results of this innovative exploration drilling. The Delft geothermal project is therefore a great example of a beneficial interplay of economic and societal interest (i.e. city heating, CO<sub>2</sub>-neutral campus) and scientific innovation.