(Environmental) impact of inhibitors applied in the geothermal sector in The Netherlands

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The geothermal fluid produced in The Netherlands is rich in carbon dioxide, natural gas, salts and also contains some toxic metals. The composition of the geothermal water in combination with high temperatures and in some cases applied degassing may cause corrosion, scaling and biofouling. In the geothermal sector in The Netherlands inhibitors are applied in small dosages (ppm level) to increase the capacity of the well and to prevent corrosion, scaling and biofouling. This research provides an overview of the current practice of inhibitors in the Dutch geothermal sector. It has been investigated why and how inhibitors are applied, what type and what dosages of inhibitors are used and which chemicals are involved. The potential (environmental) impact of inhibitor application has been assessed. For this purpose the possible leakage paths of inhibitors to the environment have been identified and the potential effect of inhibitor leakage has been quantified through groundwater modelling. The result is a recommendation for safe and effective inhibitor application and monitoring of inhibitors in geothermal practice in The Netherlands.