

## **NORM in the exploration phase of geothermal energy facilities**

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### **Abstract**

In recent years, most geothermal facilities in Europe have been confronted with the occurrence of NORM. For this reason, geothermal energy production has been added to the positive list of NORM industries in the New Basic Safety Standards (2013/59/Euratom).

To date, Belgium has only one large scale deep geothermal energy facility. However, a handful of projects are in the exploration phase and many more are in the planning phase. Most of these new facilities are being built or planned in the Campine region, where geothermal potential is present at feasible depths above 4 kilometers.

Measurements on the liquid and solid residues produced during the exploration phase of these new wells have shown that the formation water has a high <sup>226</sup>Ra and <sup>228</sup>Ra content, as well as high concentrations of chlorine. This leads to very specific issues in storage, handling and treatment of large quantities of liquid and solid NORM residues during the exploration phase.

The presentation will present an overview of geothermal energy production in Belgium. It will address the management of NORM during the exploration phase and compare it to the issues which are frequently encountered -and which have been well characterized in the past- during the exploitation phase.