

**Low-grade metamorphic slates, a potential host-rock for high-level and/or long-lived radioactive waste disposal**

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Three main types of host rock are currently considered for the geological disposal of high-level and/or long-lived radioactive waste: homogeneous crystalline rocks, salt, and argillaceous rocks, from plastic clays to indurated claystones.

We propose to expand the third category with low-grade metamorphic slates. To date, this rock type has been considered unqualified as a potential, well-characterized host rock for radioactive waste disposal, primarily because a secondary tectonic fabric becomes the dominant anisotropy, largely obliterating identifiable lithostratigraphical formations. Moreover, applying the criteria for a disposal system relying on the intrinsic properties of plastic clays and indurated claystones as geological barrier (e.g. sealing capacity; hydraulic conductivity) to slates, inevitably leads to their exclusion.

Based on a preliminary survey of Palaeozoic slates in the Belgian subsurface, we demonstrate that slate bodies, strongly affected by a tectonometamorphic influence in low-grade metamorphic conditions, may have a potential as host rock for radioactive waste disposal.

Slate belts are thus potentially interesting target areas for the geological disposal of high-level and/or long-lived radioactive waste, regarding their geological stability and isolation. As a potential host rock, slates need, however, a proper approach with a new set of evaluation criteria, taking into account the particular qualities as a geological barrier, and a proper design of the disposal system, rethinking the engineering barrier accordingly.