

HYDROGEOLOGICAL CHARACTERISATION OF THE TRANSITION OPALINUS CLAY – PASSWANG FORMATION

Context and objectives

The Opalinus clay is the proposed target formation in Switzerland for the long term storage of radioactive waste. In order to plan such a repository, the characteristics of the Opalinus clay formation are studied at the Mont-Terri underground laboratory (St-Ursanne, Jura). The Opalinus clay formation (aquiclude) is bounded by aquifers and the boundaries between the formations are commonly conceptualized as planar and distinct interfaces implying a sharp change of hydraulic properties (e.g. hydraulic conductivity). However, due to the sedimentary conditions prevailing during the deposition of these sediments, the transition from the Opalinus clay formation to the overlying Passwang formation could rather be a gradual one. The hydrogeological characteristics of this transition is currently not well understood. The on-going extension of the Mont-Terri laboratory is providing a unique opportunity to investigate the hydrogeological characteristics of this transition.

Research approach and methodology

Existing boreholes will be used as well as new boreholes will be drilled at Mont-Terri across the Opalinus Clay to Passwang formation transition. The methodology will include 1) integration of core logging, hydrochemical and hydraulic data in order to develop local geological models of the transition, 2) planning and execution of hydraulic tests and pore water sampling, 3) interpretation of hydraulic test data, 4) integration and synthesis of the hydrogeological, sedimentary and hydrochemical data.

Partners and collaboration

The project will be supervised by Prof. B. Valley and Dr. D. Jaeggi from swisstopo (the Swiss Geological Survey) in collaboration with Martin Herfort (ENSI, the Swiss Federal Nuclear Safety Inspectorate). The Mont-Terri laboratory is managed by swisstopo and interactions with the laboratory personal will be required for the field component of the MSc thesis. The student will also benefit from the very active and stimulating research community that work at the Mont-Terri laboratory.

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