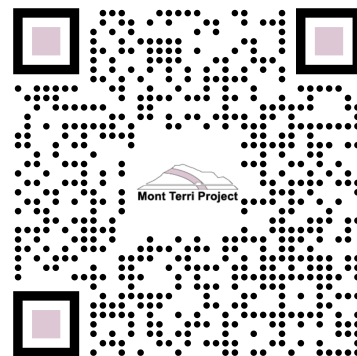


Mont Terri Project Underground Rock Laboratory

Report period: October 16–22, 2023

Assembled and edited by swisstopo, St-Ursanne



Spotlight of the week: CI-D Experiment: Diffusion across a 10-year old concrete/claystone interface. Interaction between cement and Opalinus Clay alters the porosity and pore structure at the interface. Such porosity changes may obstruct diffusive water, solute and gas transport across interfaces. In the scope of the CI-D experiment, the impact of such an alteration layer on diffusion is studied. For this purpose, Tritium-bearing water and ^{36}Cl are circulated in a cement-like pore water to study the diffusion of these elements across the 10-years old cement-clay interface under in-situ conditions. In September 2023 (after 4 years of circulation), the CI-D experiment will now be overcored, the samples analysed and compared with the modelling predictions. More on the overcoring will come in the following weeks.

BIM (Mont Terri Building Information Modeling) experiment

- From Monday to Tuesday, October 16–17, C. Oreja and C. Siegrist (ATB) implanted the fixpoints in the entire lab along the tunnel axes. These points are important to link old drilling and experiment data to the new BIM system (**Figure 1**).

BN (Bitumen-Nitrate-Clay Interaction) experiment

- On Thursday, October 19, S. Schefer (swisstopo) checked the levels in the gas traps.

CD-A (Influence of Humidity on Cyclic and Long-Term Deformations) experiment

- On Thursday, October 19, S. Schefer (swisstopo) with the remote assistance of S. Tunon (Amberg) troubleshooted the connection problems between the psychrometers and the DAS.

CI-D (Diffusion Across 10-Year-Old Concrete/Claystone Interface) experiment

- From Monday to Friday, October 16–20, A. Eul and S. Braunschweig (Eul GmbH) started with drilling the stabilisation boreholes in the approach borehole BCI-D4 in preparation for overcoring the first section through the upper part of the CI-D test region. The approach borehole has a depth of 6.6 m. The stabilization work with fibreglass and epoxy resin was done by U. Mäder (RWC) (**Figure 2**).

GT (Gas Transport Models and the Behavior of OPA to Gas Pressure) experiment

- On Tuesday, October 17, S. Schefer (swisstopo) removed the miniRuedi and prepared it for shipping to ETHZ. The data were uploaded to the server.

HE-E (In-Situ Heater Test in VE-Micro-Tunnel) experiment

- From Monday to Friday, October 16–20, the drilling team consisting of A. Eul and S. Braunschweig (Eul GmbH) together with the technical/scientific team consisting of F. Kober, M. Treuthardt (Nagra) and U. Mäder (RWC) managed to recover the previously stabilised interface Opalinus Clay / granular bentonite quite successfully from BHE-E3 (**Figure 3**).
- From Tuesday to Thursday, October 17–19, M-V. Villar and N. Gimeno (CIEMAT) performed sample analysis of the bentonite, including sampling for water-content determination, and measuring density on a few samples (**Figure 4**).

MA-A (Modular Platform for Microbial Studies) experiment

- On Thursday, October 19, S. Schefer and A. Grignaschi (swisstopo) exchanged the gas bags for the miniRuedi measurements.

SW-A (Large-Scale Sandwich Seal in Opalinus Clay) experiment

- On Tuesday, October 17, S. Schefer (swisstopo) refilled the HPT of shaft 1.
- On Friday, October 20, S. Schefer (swisstopo) refilled the HPT of shaft 1 and exchanged the pressure reducer on the injection for shaft 2. With the help of S. Tunon (Amberg) he changed the wiring of the valves 3 and 5 of the injection cabinet for shaft 2. They now show the true open/closed information.

Visits

Day	Date	Group Name	Group Size	Visitors Guide
Tue	17.10.2023	Österreichischer Entsorgungsbeirat	9	D. Jaeggi (swisstopo)
Tue	17.10.2023	HWV - Ausflug	16	R. Nicol (swisstopo)
Wed	18.10.2023	Kantonsschule Baden	22	H. Sager (Nagra)
Wed	18.10.2023	Kantonsschule Seetal	18	H. Sager (Nagra)
Thu	19.10.2023	Kernkraftwerk Leibstadt	21	H. Hauser (freelance)
Thu	19.10.2023	Syndicom, Conférence Latine	38	C. Boner (freelance) R. Nicol (swisstopo)
Fri	20.10.2023	Eawag, Finanzabteilung	13	D. Jaeggi (swisstopo)

Figures



Figure 1: BIM: Implanting one of the many fixpoints along the tunnel axes (S. Schefer, swisstopo).



Figure 2: CI-D: Preparation of the core barrel for the overcoring (S. Schefer, swisstopo).



Figure 3: HE-E: Beautiful core from the interface between Opalinus Clay and bentonite close to the heater. The stabilizing drillings filled with resin are also visible (S. Schefer, swisstopo).



Figure 4: HE-E: Sampling from the overcored clay/bentonite interface (S. Schefer, swisstopo).