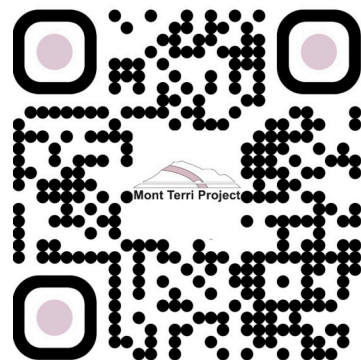


Mont Terri Project Underground Rock Laboratory

Report period: February 10–16, 2025

Assembled and edited by swisstopo, St-Ursanne



Spotlight of the week: An unexpected microbial community living in Mont-Terri pore water can have an impact on iron corrosion but could also represent a sustainable gas-sink thanks to hydrogen metabolism. The in-situ experiments are conducted as a part of the Iron-Corrosion Experiment (IC-A). The modules contained Wyoming bentonite at 1.25 g/cm³ density and metal coupons and were retrieved after 3 years of incubation in the borehole. This phase of the experiment will target: (1) the role of residual oxygen (O₂) trapped within the bentonite buffer on microbial communities, including potential inhibition of sulfate-reducing bacteria (SRB), corrosion of carbon steel and copper, and the mineralogical and chemical changes in bentonite; (2) the ability of Opalinus Clay porewater populated by up to 40% of SRB, to colonize bentonite, along with the mobility of bacteria within fully saturated bentonite; and (3) the persistence of aerobes in bentonite despite anoxic conditions to better understand microbial survival strategies in the bentonite buffer and the potential impact of aerobes on inhibiting SRB growth (Fig. M. Abdelouhabi, swisstopo).

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

- From Wednesday to Friday, February 12–14, S. Costabel and R. Dlugosch (BGR) performed the seasonal NMR-measurements on the wall of both Twin Niches (**Figure 1**).

FS-B (Imaging the Long-Term Loss of Faulted Host Rock Integrity) experiment

- From Monday to Thursday, February 10–13, A. Eul, S. Braunschweig and F. Durulan (Eul GmbH) installed the rig for BFS-B15 and drilled the first 16 m (vertical, 146 mm) (**Figure 2**).

HT (Hydrogen Transfer in Opalinus Clay) experiment

- On Wednesday, February 12, T. Theurillat (swisstopo) emptied the Tedlar bag of the experiment while the scale displayed 1174 g.

IC-A (Corrosion of Iron in Bentonite) experiment

- On Tuesday, February 11, N. Diomidis, M. Andrew (Nagra), A. Ammon and A. Jakupi (Solexperts) retrieved 3 modules from BIC-A1 that had been in the borehole since March 2022 and together with M. Fruttschi, N. Jakus and A. Haji (EPFL) also took water samples for microbial and chemical analyses at EPFL. Maybe the most important aspect is the installation of a new handling apparatus that will allow easier retrieval of modules in the future. Retrieval has been difficult the last couple of times due to accumulation of mud and small "stones" from the rock on the top of the top module (**Figure 3**).

MA-A (Modular Platform for Microbial Studies) experiment

- On Wednesday, February 12, M. Mariani and C. Rolland (EPFL) sampled water for incubation in crushed opalinus clay with hydrogen at EPFL (**Figure 4**).
- On Thursday, February 13, C. Rolland (EPFL) changed the argon bottle flushing BMA-A1.

SM-C (Permanent Nanoseismic Monitoring) experiment

- On Friday, February 14, S. Schefer (swisstopo) refilled 180 ml of demineralized water into the HLS.

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

- On Thursday, February 13, T. Theurillat (swisstopo) refilled the HPT of shaft 1.

Visits

Day	Date	Group Name	Group Size	Visitors Guide
Thu	13.2.2025	Tofwerk AG	19	R. Nicol (swisstopo)

Figures



Figure 1: CD-A: S. Costabel and R. Dlugosch performing NMR measurement in Niche Open Twin (M. Abdelouhabi, swisstopo).



Figure 2: FS-B: Everything is ready for drilling on BFS-B15 (S. Schefer, swisstopo).

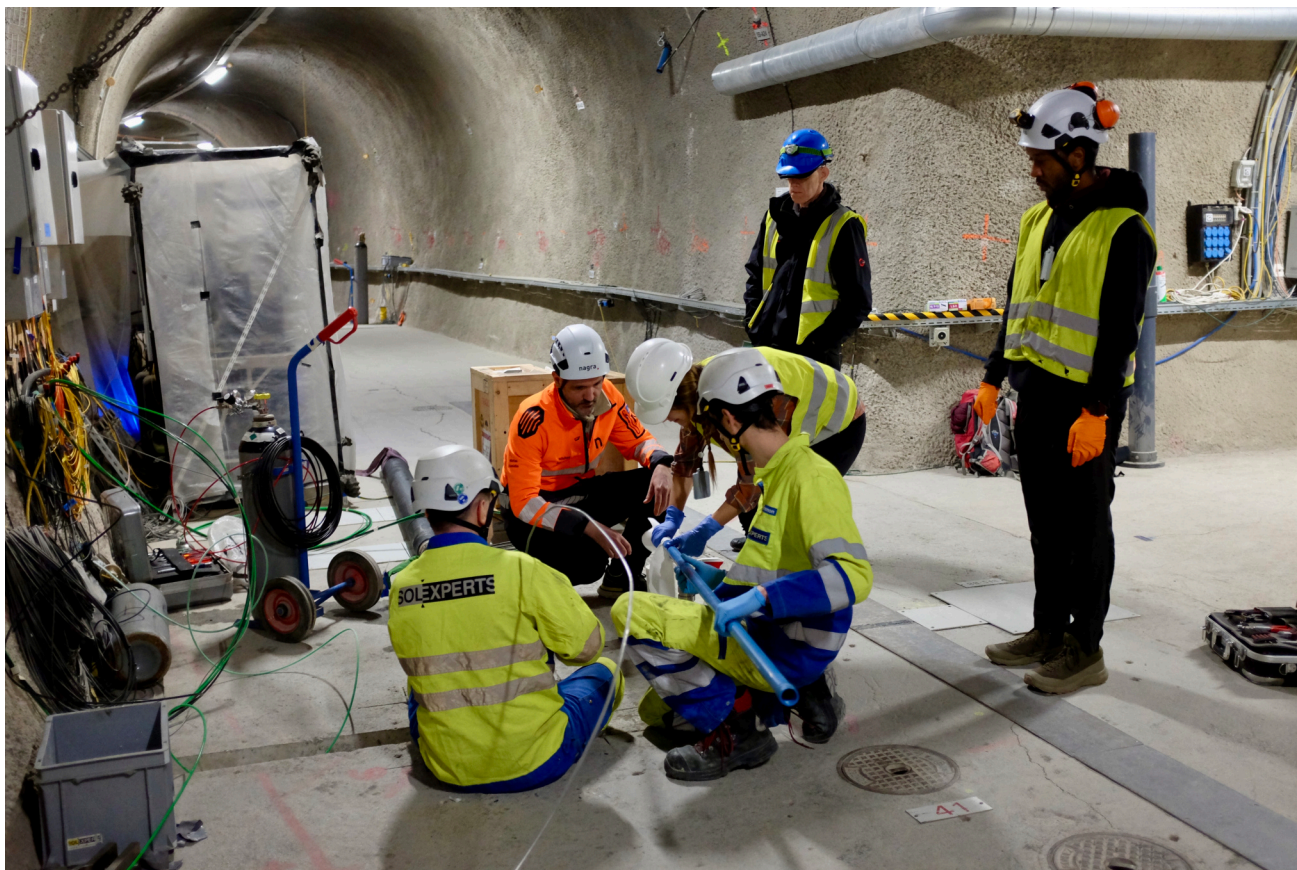


Figure 3: IC-A: Removing the modules from BIC-A1 (S. Schefer, swisstopo).



Figure 4: MA-A: Scientists from EPFL sampling microbial-rich pore water anoxically in the glovebox (M. Abdelouhabi, swisstopo).