Mont Terri Project
Underground Rock Laboratory

Mont Terri Rock Laboratory

Field report: July 19-August 15, 2021 (Phase 27)

CD-A (Influence of Humidity on Cyclic and Long-Term Deformations) experiment
- On every Tuesday and Thursday, M. Felder or S. Schefer (swisstopo) took gas samples from Niche Closed Twin.
- From Monday to Wednesday, August 9 to 11, J.L. Garcia-Sineriz and A. Jimenez (both Amberg infraestructuras) were on site in order to install 4 thermo-hygrometers and 4 psychrometers for suction monitoring in two vertical and two horizontal boreholes in both niches open twin and closed twin (Figure 1). The works were supervised and supported by T. Cajuhi (BGR). The shallow (<80 cm), 45 mm diameter boreholes were drilled by M. Falbriard (independent) under supervision of T. Theurillat (swisstopo) (Figure 2).
- Due to a configuration problem with the acquisition pc dedicated to the new sensors, C. Noirjean and G. Vinciguerra (both TLMS) came on site in order to fix it.
- On Friday, August 13, T. Theurillat installed a ventilator in Niche Closed Twin. This device is dedicated to mix humidity and tracer gas Neon in the closed room.

CI-D (Diffusion across 10-year old Concrete/Claystone Interface) experiment
- Urs Mäder (Rock-Water Consulting, RWC) visited CI-D on Tuesday, August 10, for maintenance on the blocked circulation that stopped working some weeks ago. The fluid circuit in the cabinet was flushed, cleaned and the in-line filter changed. The system is now working properly again.

HS (Hydrogeological Survey of the Mont Terri Anticline) experiment
- On Tuesday, July 20, C. Bertrand (Univ Franche Compté) installed a titanium pressure/temperature/conductivity probe at the MT-6 monitoring spot. The monitoring of existing sources along the security gallery is part of the HS-long-term monitoring and serves as well as base-line monitoring for the future borehole.
- On Tuesday, August 10, O. Zuber and D. Rondez (Zuber constructions Sarl) prepared the well head for the future BHS-1 borehole by removing the concrete down to 40 cm (Figure 3). Next week Stump BTE will mobilize the drill rig and on August 23, it is planned to start with the coring and sampling.
- On Tuesday, August 10, A. Meerstetter and the drillmaster D. Ehlers (both Stump BTE) came on-site in order to discuss the last details before mobilization and installation of the equipment planned for upcoming week.

SW-A (Large-Scale Sandwich Seal in Opalinus Clay) experiment
- On Friday, July 23, S. Schefer and V. Regard (swisstopo) inspected the cables inside shaft 1 for humidity. The installation seems to have resisted to the raised pressure and therefore the injection process can be continued over the summer break.
- On Tuesday F. Rodriguez Gaspar and two collaborators (Marti AG) drilled reservations through the concrete for 5 sampling boreholes at Ga04/08, close to Niche TT (Figure 4). The works were supervised by T. Theurillat (swisstopo).
On Wednesday, August 11, after a closer inspection of the experiment lines and the hydration cabinet, D. Jaeggi and V. Regard (both swisstopo) increased the gas pressure from 5 bar to 8 bar. The system seemed first to sustain the pressure increase without any leakage or critical sensor signal, however about 1.5 hours later a new leak was detected on the ERT cable side and the entire injection process was stopped immediately. After discussion with K. Wieczorek (GRS) saturation was continued, however by gravitational injection only and therefore without additional gas pressure at the well head. For the moment the water level inside the feeding borehole is nearly stationary and located at the level of the tunnel floor approximately.

Varia

- The rock lab was closed from July 19 to August 8 for on-site works and visits.
- On August 5 during the summer break of the rock laboratory the main transformer outside the rock laboratory was exchanged. Due to a malfunctioning of the Ga18 generator, some experiments in Ga18, such as SW-A and CD-A had no current over a period of about 4 hours. This malfunctioning occurred despite the fact, that the concerned generator had been successfully tested about 2 weeks earlier.
- On August 10 to 13, P. DaFonseca and A. Abonzgid (both sixense) performed the yearly maintenance of the Mont Terri servers of the DAS in St. Ursanne and in Bern. Additionally the corresponding network infrastructure in the rock laboratory was inspected and some devices replaced. This inspection included the annual on-site maintenance mission at FE.

Visits

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Event</th>
<th>Person</th>
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</thead>
<tbody>
<tr>
<td>Fri</td>
<td>13.07.2021</td>
<td>Friday the 13th - Group Rolf Sempach</td>
<td>16 C. Boner</td>
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<tr>
<td>Sat</td>
<td>14.07.2021</td>
<td>Soleure Road Chapter – Group U. Baechler</td>
<td>15 C. Boner</td>
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D. Jaeggi and S. Schefer, August 15, 2021
Figure 1: CD-A: J.L. Garcia-Sineriz (Amberg infraestructuras) and T. Cajuhi (BGR) during the installation of the suction probes in Niche Open Twin (Photo: V. Regard, swisstopo).

Figure 2: CD-A: M. Falbriard (independent) drilling small diameter boreholes in Niche Closed Twin (Photo: V. Regard, swisstopo).
Figure 3: **HS:** O. Zuber (Zuber constructions Sarl) preparing the reservation for BHS-1 in Ga98N (Photo: V. Regard, swisstopo).

Figure 4: **SW-A:** Drilling of reservations for sampling boreholes SW-A (Photo: V. Regard, swisstopo).