Mont Terri Rock Laboratory

Field report: June 28 - July 11, 2021 (Phase 27)

BN (Bitumen-Nitrate-Clay Interaction) experiment
- On Friday, July 9, M. Felder and S. Schefer (swisstopo) installed five new sampling containers into interval three and with the remote help of S. Smets (SCK*CEN) set the flow rate to 40 ml/min. After six hours they removed the first sampling container and set the flow rate down to 10 ml/min.

CD-A (Influence of Humidity on Cyclic and Long-Term Deformations) experiment
- On Tuesday and Thursday in both weeks, M. Felder and S. Schefer (swisstopo) took gas samples from Niche Closed Twin.

CS-D (CO₂: Studying Caprock and Fault Sealing Integrity) experiment
- On Wednesday, June 30, L. Passarelli and A. Rinaldi (ETHZ) were on site to perform a mini-ruedi measurement and to take a fluid sample. Afterwards, they disconnected the mini-ruedi and brought it back to Zurich for maintenance.
- Additionally, they removed cables for the 4 AE sensors that were retrieved from borehole BCS-D6.

GT (Gas Transport Models and the Behavior of OPA to Gas Pressure) experiment
- On Tuesday June 29, B. Helmlinger (Solexperts) removed the fibre optic interrogator for maintenance.

HS (Hydrogeological Survey of the Mont Terri Anticline) experiment
- On Thursday, July 8, M. Glück and A. Meerstetter (Stump BTE) together with D. Jaeggi, T. Theurlillet and S. Schefer (swisstopo) visited the site of the upcoming borehole BHS-1 (Ga98 Nord) to discuss the installation of the drilling machine and the water tanks. This borehole will explore the underlying Staffelegg Formation.

IC-A (Corrosion of Iron in Bentonite) experiment
- On Tuesday and Wednesday, July 6-7, the PI N. Diomidis (Nagra) together with N. Burzan, M. Frutschi and F. Dehghani (EPFL) were on site for the replacement of the modules inside BIC-A1.
  - They sampled the BIC-A1 borehole water, collected subsamples of sterile filtered water for Fe^{2+}, Fe^{3+}, HS-, cations, anions, trace metals, DIC and DOC. They also measured onsite pH and EH.
  - 3 x 200 ml were filtered to collect borehole-water microorganisms for DNA extraction and DNA sequencing. 200 ml water was poisoned with paraformaldehyde for the staining/counting of microbes under the microscope.
  - With the help of L. Schwab and A. Jakupi (Solexperts), 5 IC-A modules were retrieved and 5 new IC-A modules were deployed, the surface of these 10 modules was sampled with forensic swabs for DNA analysis (Figure 1).
SW-A (Large-Scale Sandwich Seal in Opalinus Clay) experiment

- On Tuesday, July 6, S. Tuñon and P. Sanchez (Amberg) fixed the leakage on one of the pressure sensors in shaft 1. They used a resin chamber to isolate the individual electric cables from the surrounding insulation (Figure 2).
- On Wednesday, July 7, D. Jaeggi (swisstopo) raised the gas pressure of the injection system to 2.0 bars to check the tightness of the system. No further leakage could be detected so far.

Varia

- **Yearly summer-break**: The lab will be closed from **July 19 until August 6**. Daily controls and picket service will continue of course. Happy holydays to everyone!
- On July 1st we entered Phase 27.
- The European Soccer Championships kept everyone busy, happy and sad – depending who they were rooting for… (Figure 3)

Visits

<table>
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<tr>
<th>Day</th>
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<th>Group/Location</th>
<th>People</th>
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<tbody>
<tr>
<td>Fr</td>
<td>02.07.2021</td>
<td>Students Earth Sciences, University of Geneva</td>
<td>S. Schefer</td>
</tr>
<tr>
<td>Thu</td>
<td>08.07.2021</td>
<td>Students Gymnasium Laufen (BL)</td>
<td>C. Boner, R. Nicol</td>
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<td>Fri</td>
<td>09.07.2021</td>
<td>Group “Queers &amp; Peers”, Zurich</td>
<td>R. Nicol</td>
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<tr>
<td>Sat</td>
<td>10.07.2021</td>
<td>Naturwissenschaftliche Gesellschaft, Winterthur (ZH)</td>
<td>C. Boner, H. Hauser</td>
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D. Jaeggi and S. Schefer, July 10, 2021

Figure 1: **IC-A**: Removing the modules inside BIC-A1 (Photo: V. Regard, swisstopo).
Figure 2: SW-A: S. Tuñon keeping track of the repairs (Photo: M. Felder, swisstopo).

Figure 3: Varia: Dr. Sheldon Cooper - Fun With Flags (Photo: S. Schefer, swisstopo).