

TECHNICAL MEETING

TM-42

13 & 14 May 2025

Lycée cantonal
Place Blarer-de-Wartensee 2
2900 Porrentruy (Switzerland)

and

Visitor Center Mont Terri Project
Rue de la gare 63
2882 St-Ursanne

Final programme

Tuesday, 13 May 2025, Porrentruy

09:00	Welcome address, aims and organisation of the meeting	<i>Christophe Nussbaum (swisstopo)</i>
09:10	Extraordinary information swisstopo and Canton Jura	<i>Fridolin Wicki (Director swisstopo)</i> <i>David Eray (Minister Canton Jura)</i>
Key results from selected radwaste experiments (1/3) Chairperson: David Jaeggi (swisstopo)		<i>Speakers</i> <i>Experiment partners</i>
09:40	Keynote: The role of the Mont Terri Project for the development of the Swiss DGR	<i>Tim Vietor (Nagra)</i>
10:10	FE Experiment: Insights into 10 years of heating	<i>Raphael Schneeberger (Nagra)</i> <i>ANDRA, BGE, BGR, DOE, ETH, FANC, GRS, Nagra, NWMO, NWS</i>
10:25	The Sandwich (SW-A) project – In-situ, lab, simulation results	<i>Katja Emmerich (KIT) & Matthias Hinze (GRS)</i> <i>BGR, ENRESA, ENSI, GRS, NWMO, NWS, swisstopo</i>
10:40	Progressive damage evolution of the PF/PF-A experiment borehole	<i>Martin Ziegler (swisstopo)</i> <i>BGR, CHEVRON, ENSI, ETH, swisstopo</i>
10:55	Coffee break	<i>Michèle Nussbaum (swisstopo)</i>
Key results from selected radwaste experiments (2/3) Chairperson: Martin Ziegler (swisstopo)		<i>Speakers</i> <i>Experiment partners</i>
11:25	Anisotropic creep behavior and long-term strength of shaly Opalinus Clay	<i>Lina Gotzen (RWTH Aachen)</i> <i>ENSI</i>
11:40	DR-C experiment: status and future work	<i>Guillaume Pochet (FANC)</i> <i>ANDRA, BASE, ENSI, FANC, Helmholtz, NWS, SCK CEN, swisstopo</i>
11:55	Quantification and constraints of microbial H ₂ consumption in sand-bentonite	<i>Camille Rolland (EPFL)</i> <i>BGE, Nagra, NWMO</i>
12:10	Solute transport across an aged concrete/claystone interface (CI-D): tracking of out-diffusion of 36-Cl and HTO from concrete, and in-diffusion of Cl after 4.4 years of tracer circulation	<i>Urs Mäder (RWC)</i> <i>ANDRA, CRIEPI, FANC, Helmholtz, Nagra, NWMO, NWS, OBAYASHI, SCK CEN</i>
12:25	Lunch	<i>Michèle Nussbaum (swisstopo)</i>

CO ₂ and gas experiments (3/3) Chairperson: Christophe Nussbaum (swisstopo)		Speakers Experiment partners
13:45	Experiments to resolve the Mont Terri anticline hydrogeology	<i>Michael Kühn (Helmholtz)</i> <i>BGR, Helmholtz, Nagra, NWS, swisstopo</i>
14:00	CO ₂ Long-term Periodic Injection Experiment (CO ₂ LPIE): characterization of the experimental volume and status of the in-situ experiment	<i>David Jaeggi & Martin Ziegler (swisstopo)</i> <i>BGR, CHEVRON, ETH, swisstopo</i> <i>(cofunded by BFE, cemsuisse and VBSA)</i>
14:15	Some results of the CS-E experiment: mechanics-based analysis using fiber optic deformation and pressure/flow rate signals	<i>Prescelli Annan (ETH)</i> <i>CHEVRON, ETH, SHELL, swisstopo</i>
14:30	THM response of the Mont Terri Main Fault – lessons learned from FS experiments and perspectives	<i>Yves Guglielmi (US DOE)</i> <i>BGR, CHEVRON, DOE, ENSI, ETH, IRSN</i> <i>Nagra, SHELL, swisstopo, TotalEnergies</i>
14:45	Keynote: Inside the Jura Fold-and-Thrust Belt mechanical wedge	<i>Jon Mosar (University of Fribourg)</i>
15:15	Final information and group photo	<i>Christophe Nussbaum (swisstopo)</i>
15:25	Coffee break	<i>Michèle Nussbaum (swisstopo)</i>
Poster session		
15:25 - 17:45	Poster session	<i>David Jaeggi</i> <i>Martin Ziegler</i> <i>Senecio Schefer (swisstopo)</i>
17:45	Apéro	<i>Michèle Nussbaum (swisstopo)</i>
18:45	Invited dinner (sponsored by Ensi)	

List of posters

<i>List of posters</i>	<i>Authors</i>
1. Thermo-hydraulic characterization of bentonite in partially saturated conditions at two temperature levels	<i>E. Crisci (NESOL) et al.</i>
2. CD-A twin niches after 5 years: Measured differences in HM parameters	<i>G. Ziefle (BGR) et al.</i>
3. Development and benchmarking of 3D hydro-mechanical model for unsaturated fractured rocks	<i>M. Raharsya Andiva (Uppsala University)) et al.</i>
4. 3D modelling of coupled hydro-mechanical processes in fractured Opalinus Clay shale	<i>M. Raharsya Andiva (Uppsala University)) et al.</i>
5. SW-A experiment: Interpretation of recent measurement data	<i>M. Hinze (GRS) et al.</i>
6. Numerical simulation of the Sandwich sealing system - An international benchmark study	<i>L. Friedenberg (GRS) et al.</i>
7. Implementation and testing of GRS' alternative approach for modelling bentonite re-saturation in the framework of COMSOL Multiphysics	<i>M. Kröhn (GRS) et al.</i>
8. Feasibility of using frictional shotcrete plugs in Clay rocks for DGR sealing	<i>J.L. García-Siñeriz Martínez (Amphos 21) et al.</i>
9. A wireless data transmission system for DGR monitoring	<i>J.L. García-Siñeriz Martínez (Amphos 21) et al.</i>
10. Fibre Optic Monitoring: Learning from experience at Mont Terri and applying this knowledge to long-term monitoring of ancient monuments in the Kings Valley of Egypt	<i>M. Perras (York University) et al.</i>
11. IS-E In-Situ Stress measurements: Current progress and future perspectives	<i>A. Tuttolomondo (EPFL) et al.</i>
12. BIM Mont Terri - A new tool for borehole planning	<i>M. Ziegler (swisstopo) et al.</i>
13. SI-C: Seismic Imaging of the Mont Terri anticline - Tomography between the surface and the tunnel	<i>S. Lüth (Helmholtz) et al.</i>
14. Gravimetric monitoring at Mont Terri in experiment HS - Hydrogeology	<i>A. Güntner (Helmholtz) et al.</i>
15. Hydrogeochemical impacts on uranium migration in the Opalinus Clay at Mont Terri	<i>T. Schöne (GFZ) et al.</i>
16. Hydrogeological characterisation of a Lower Jurassic rock unit at the Mont Terri: a new petrophysical, mineralogical and geochemical data set of the Opalinus Clay and the Staffelegg Formation	<i>M. Bonitz (GFZ Potsdam) et al.</i>

17. The partitioning of fluid phases through faults in the Bristol Channel Basin: Implications for subsurface storage.	<i>J. Connolly (Jacobs) et al.</i>
18. Microstructural Investigation of a fault zone in Opalinus Clay and potential impacts on diffusion properties	<i>L. Wiechers (KIT) et al.</i>
19. DR-D, diffusion in heterogeneous clay rock	<i>F. Heberling (INE, Helmholtz) et al.</i>
20. Effect of nitrate on the fate of Se(VI) in Opalinus Clay	<i>J. Mathijs (SCK CEN) et al.</i>
21. CI Experiment: development and emplacement of an annular grout for the HLW emplacement drifts to study long-term interaction with Opalinus Clay	<i>L. Martin (Nagra) et al.</i>
22. Microbial hydrogen consumption dynamics in Opalinus Clay backfill	<i>M.J.L. Mariani (EPFL) et al.</i>
23. Creep effects on CO ₂ storage integrity in the CO ₂ LPIE project	<i>A. Rezaeyan (Eawag, Empa, ETH) et al.</i>
24. CO ₂ LPIE experiment geological characterization and experimental setup	<i>M. Abdelouhabi (swisstopo) et al.</i>
25. Solid sequestration of CO ₂ in deep aquifers using piezo-tolerant extremophile bacteria	<i>O. Brandenburg (ETH) et al.</i>
26. Machine learning modeling for safe and scalable geological carbon sequestration	<i>D. Sciandra (EPFL) et al.</i>
27. Advanced identification of discontinuities in borehole imagery with deep learning	<i>R. Wang (SLF) et al.</i>
28. Electrical and seismic behaviour of Opalinus clayrock under desiccation	<i>A. Mendieta (Sorbonne University) et al.</i>
29. Electrical properties of Opalinus Clay as a function of confinement pressure and deformation	<i>F. Lazari (EPFL) et al.</i>
30. Transport experiments in claystone: electrostatic effects and preferential pathways	<i>A. Jenni (UniBE) et al.</i>
31. A simple contribution to an ongoing debate about the sedimentation age of the Opalinus Clay in the MTRL - Can seismic parameter distributions constrain it?	<i>K. Schuster (independent)</i>
32. Cation exchange parameters for Opalinus Clay and its confining units	<i>P. Wersin (UniBE) et al.</i>
33. GRS PE Type I- and Type II canisters: Two new canisters for transport and (long-term) storage of cores from clay-rich sedimentary rock formations	<i>M. Middelhoff (GRS)</i>
34. Mont Terri whispering gallery –The far-field response by the lab on the excavation of Ga18 (RI Experiment)	<i>M. Schoenball (Nagra) et al.</i>

Wednesday, 14 May 2025, St-Ursanne

Working group discussions (Mont Terri visitor center and Fabrique de Chaux)		Chair
08:45 -	Working Group 1: Large scale hydrogeological characterization experiments	<i>Michael Kühn (Helmholtz)</i>
10:00	Working Group 2: New innovative technologies and sensor developments	<i>Oliver Czaikovski (GRS)</i>
10:00	Coffee break	<i>Michèle Nussbaum (swisstopo)</i>
10:30 -	Working Group 3: Diffusion experiments and geochemistry of the Opalinus Clay	<i>Axel Liebscher (BGE)</i>
11:45	Working Group 4: CO ₂ and gas experiments	<i>Frederic Bourgeois (TotalEnergies)</i>
12:00 -	Wrap up: Short presentation and discussion in plenum of most important findings and results of Working Group discussions	<i>Michael Kühn (Helmholtz)</i>
12:30		<i>Oliver Czaikovski (GRS)</i> <i>Axel Liebscher (BGE)</i> <i>Frederic Bourgeois (TotalEnergies)</i>
12:30	Lunch	<i>Michèle Nussbaum (swisstopo)</i>
Visit of the rock laboratory (meeting point: Mont Terri visitor center)		
13:30 -	Laboratory visit in three groups:	<i>Thierry Theurillat (swisstopo)</i>
15:00	<ul style="list-style-type: none"> Group 1: Martin Ziegler (swisstopo) Group 2: David Jaeggi (swisstopo) Group 3: Senecio Schefer (swisstopo) 	

ENCLOSURE 1

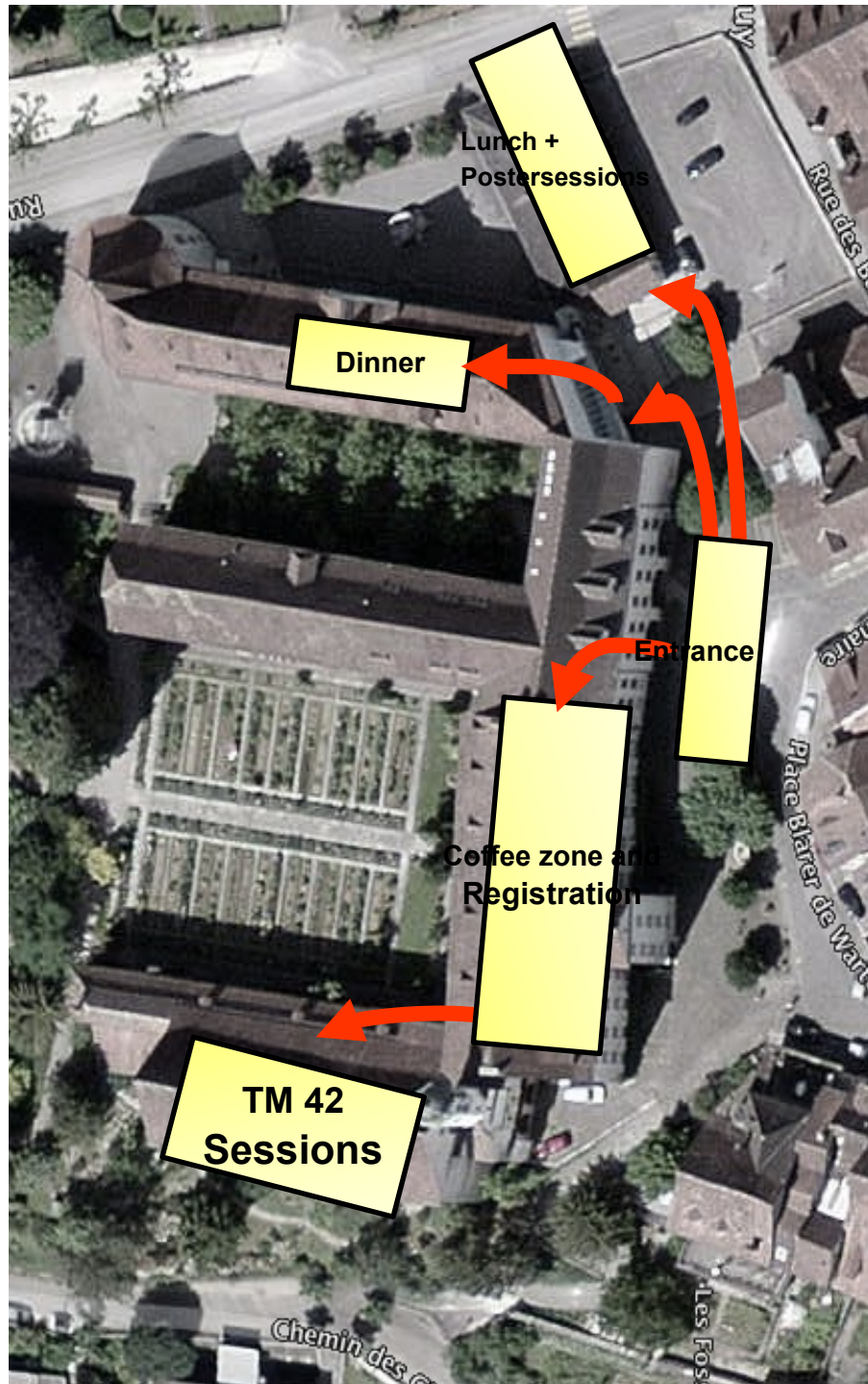
Leaflet TM-42, Porrentruy

- Please send your PowerPoint **presentation** by **12 May 2025 at the latest** to David.Jaeggi@swisstopo.ch
- There is the possibility to visit the rock laboratory on 14 May. We kindly ask the PI's for understanding that there is no possibility during the visits to work in the laboratory on their experiment. The number of participants in the rock laboratory is limited to 50 persons for safety reasons.
- Accommodation in Canton of Jura: in general, hotels are not open 24h/7d. Most of them close in the early evening. Please make sure to organize and get the key in advance in case of late arrival. Exception: Hotel Ibis in Delémont is open 24h/7d. Recommended hotels are listed in the enclosures of the invitation. In case you need help please contact Romain.Nicol@swisstopo.ch (phone +41 79 593 92 07).
- In general transportation from your hotel to Porrentruy and back has to be organised by yourself, either by car or public transport. There is a good public train network between Delémont-St-Ursanne and Porrentruy. Exception: There will be a **bus-shuttle in the morning on Tuesday, 13 May 2025** from **COOP supermarket in St-Ursanne at 08:15** and from **Porrentruy train station at 08:30 to the conference venue**. As every year we organise a **bus-shuttle after the dinner (13 May 2025) to your hotels in Porrentruy or St-Ursanne**.
- **On the second day, Wednesday, 14 May, 2025, there will be a bus transport to Mont Terri visitor centre from St-Ursanne COOP supermarket at 08:30.**
- Every presenter finds the number of his poster in the adapted meeting program. The position of your board is given by the number of the poster.
- The posters must be installed on the numbered boards by the presenters themselves before the meeting, during the coffee break or during the business lunch before 13:30 on Tuesday May 13, 2025. There is no service provided by the Mont Terri staff.
- Pins for poster installation are available.
- There is no printing service provided at the Technical Meeting.
- If you don't intend spending all poster session standing next to your poster, "post-its" will be made available to you by the Mont Terri staff to write next to your poster the time when you will be present for discussion during the poster session or coffee break.
- The posters should be removed at the end of the meeting on Tuesday evening May 13 at 18:30.

ENCLOSURE 2

Venue: How to get there

Welcome to the Technical Meeting TM-42



ENCLOSURE 3

Map of Porrentruy

TM-42 (Technical Meeting)

Detailed Situation Plan



Mont Terri Project

