

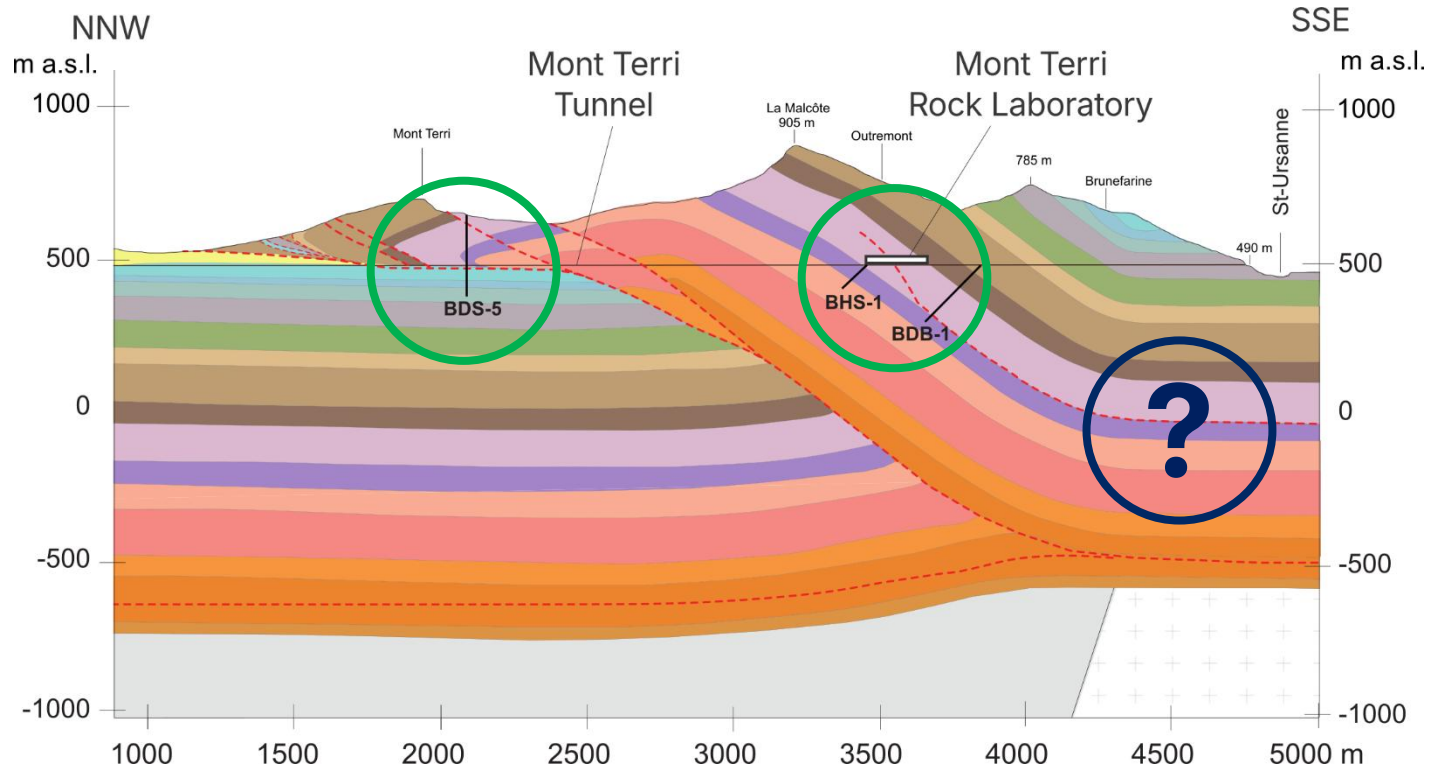
Unveiling the Hydrogeology of the Mont Terri Anticline

Insights from the DEBORAH Deep Drilling Project

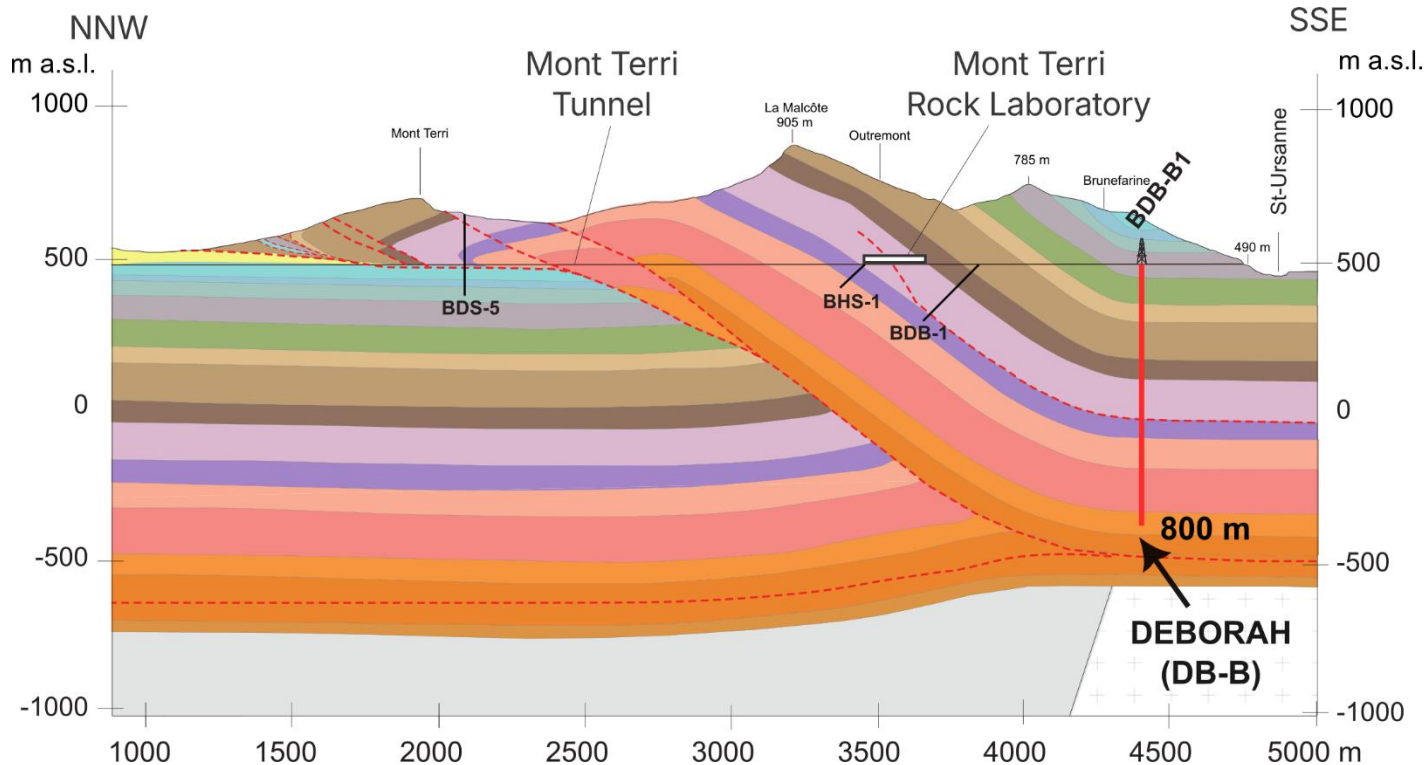
F. Kästner¹, D. Jaeggi², M. Kühn¹, S. Lüth¹, A. Güntner¹, and the DEBORAH Science Team

EGU General Assembly, 4 May 2026, Vienna

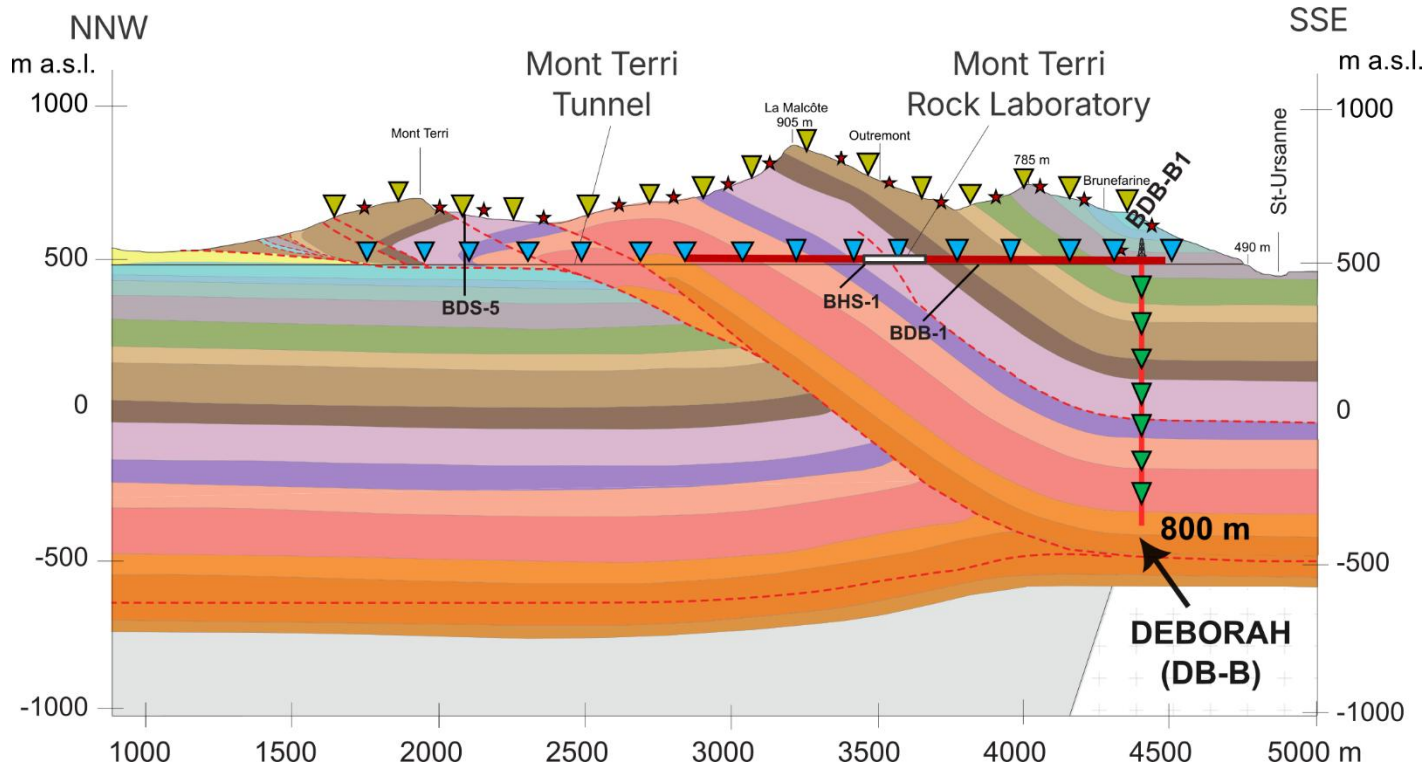
The Mont Terri Anticline

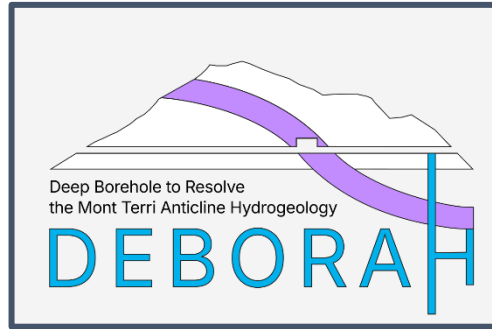


The Mont Terri Anticline



The Mont Terri Anticline





Federal Office of Topography swisstopo



Seismic Survey (SI-C)

Stefan Lüth (GFZ)



Deep Borehole (DB-B)

Michael Kühn (GFZ)



Hydrogravimetry (HS)

David Jaeggi (swisstopo)

Scientific Programme (DB-B)

- ❖ Groundwater sampling / Hydraulic tests
- ❖ In-situ stress test by HF experiments
- ❖ Online gas monitoring (OLGA)
- ❖ Geophysical wireline logging

In-situ & Downhole Testing

Sample and data management
"mobile Drilling Information System"



mDIS

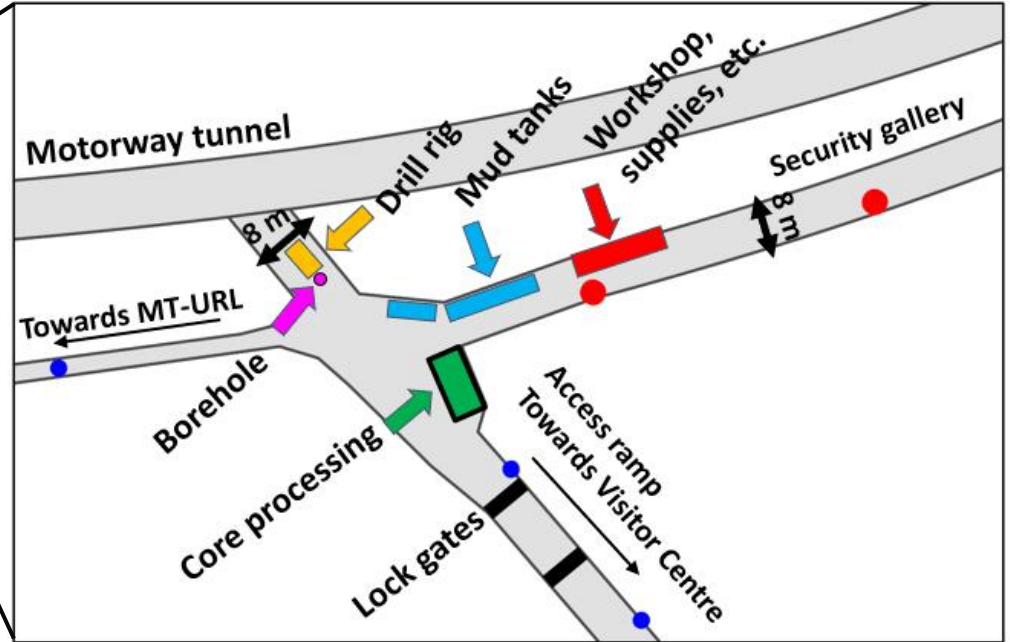
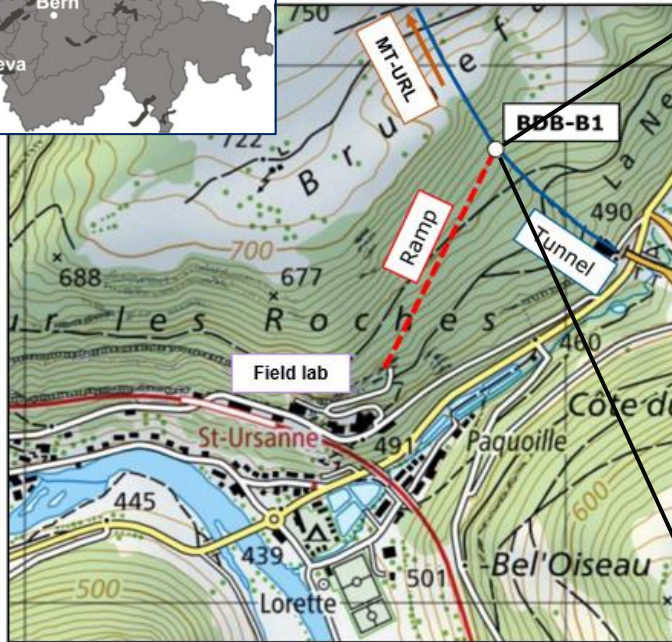
Core Evaluation

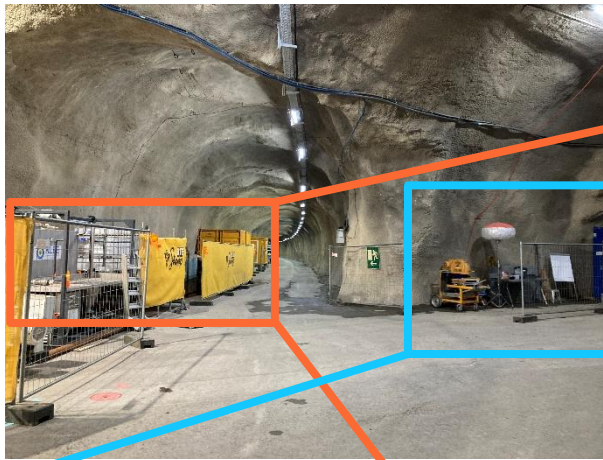
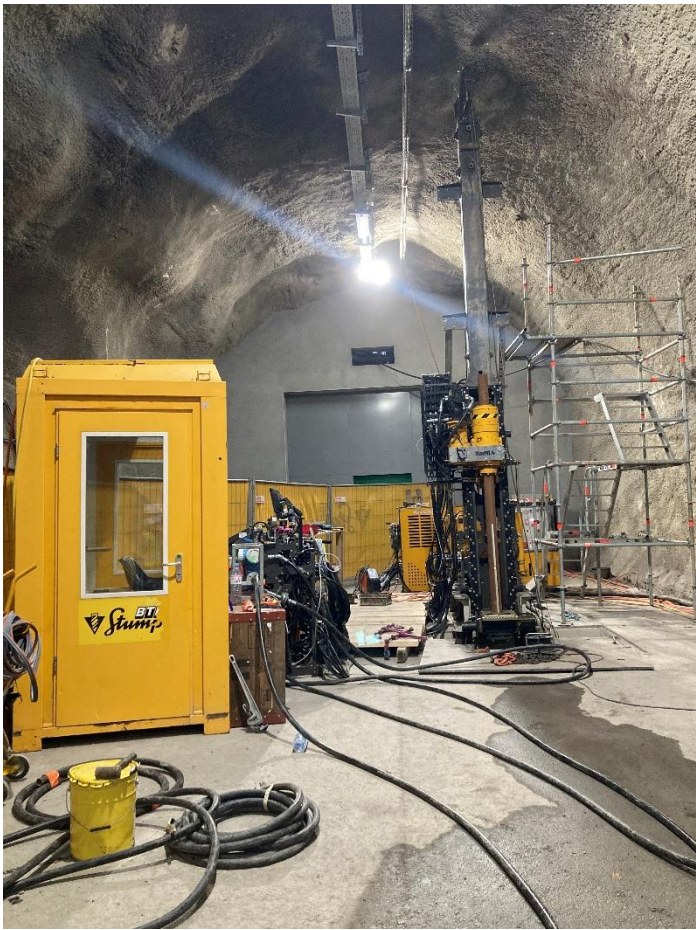
- ❖ Optical core scanning (DMT)
- ❖ Lith./biostrat. core description
- ❖ Physical core logging (MSCL)
- ❖ Thermal core logging (TCS)

Core Sampling

- ❖ Porewater chemistry
- ❖ Mineralogy/Petrography
- ❖ Geomechanics
- ❖ Microbiology

Location of the deep borehole





Field lab "Atelier de Chaux"



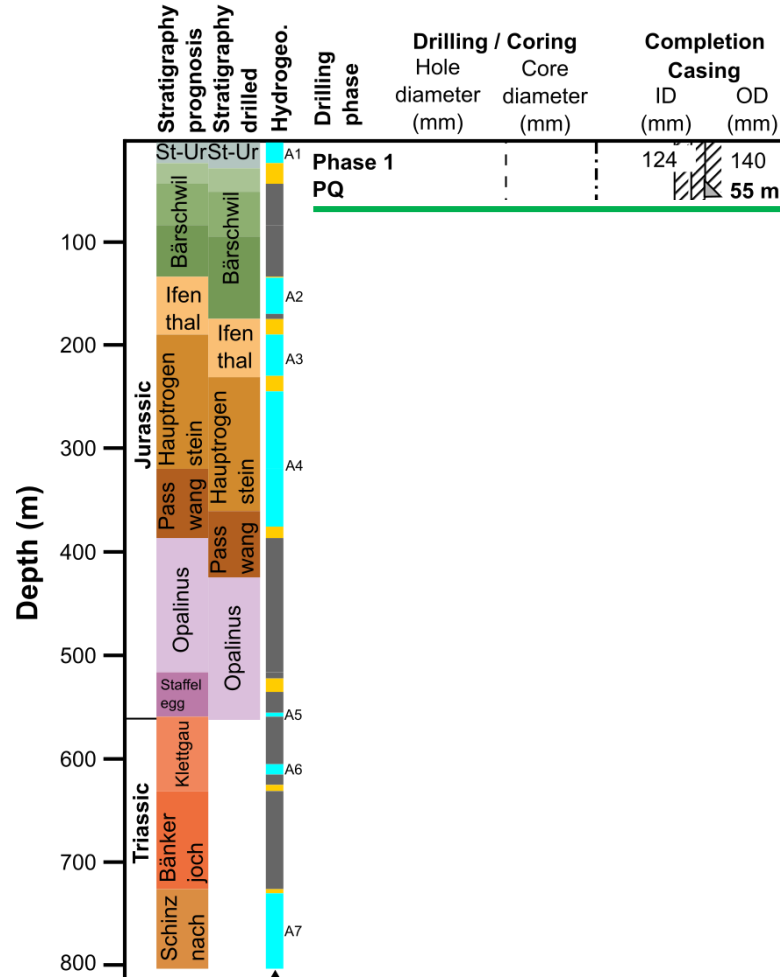
©Schefer

Drilling of section 1

- ❑ **Duration:** 18 Feb – 24 Feb
- ❑ **Drilled depth:** 0 - 55 m

- ❑ **Drill mud:** fresh water
- ❑ **Diameter:** PQ (85 mm cores)

- ❑ **Completion:**
reaming, casing, cementing
- ❑ **Logging:** reduced programme
- ❑ **Tests:** none



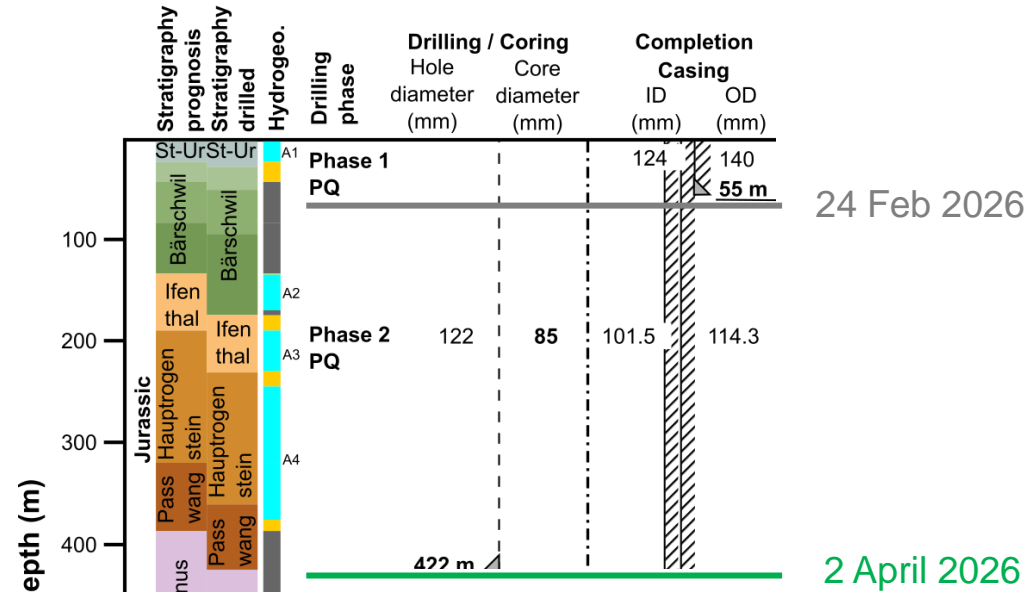
24 Feb 2026

Drilling of section 2

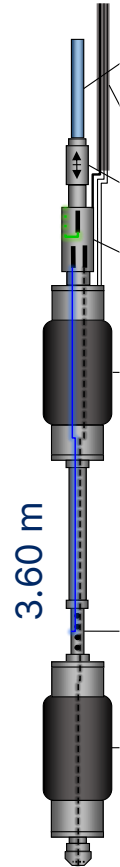
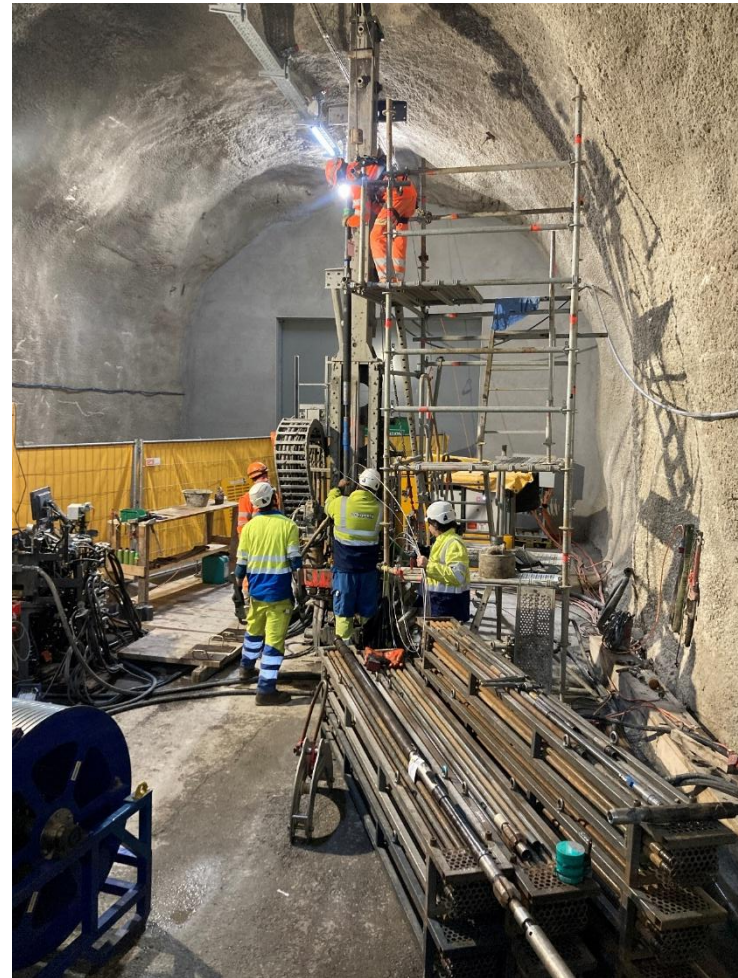
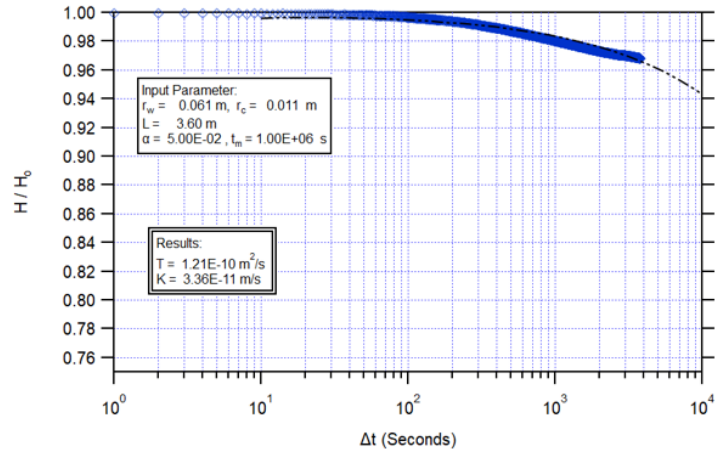
- ❑ **Duration:** 3 Mar – 2 Apr
- ❑ **Drilled depth:** 55 m – 422 m

- ❑ **Drill mud:** pure bore + INHIBI
- ❑ **Diameter:** PQ (85 mm cores)

- ❑ **Completion:** casing, cementing
- ❑ **Logging:** full programme
- ❑ **Tests:** hydrotests



- ❑ **6 tests intervals** in Hauptrogenstein and Passwang Fm
- ❑ Highest hydraulic conductivity of $3.36\text{E-}11$ m/s
- ❑ No water samples because of very low permeability

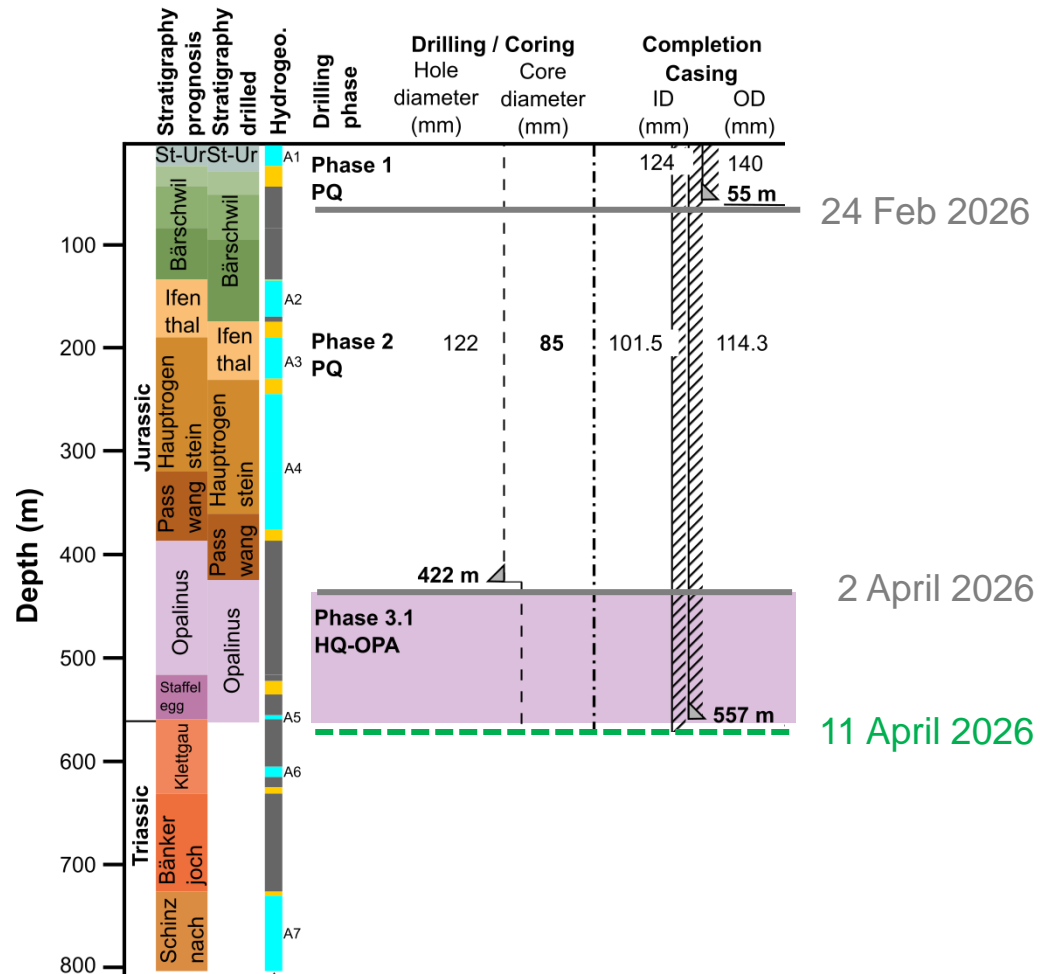


Drilling of section 3.1

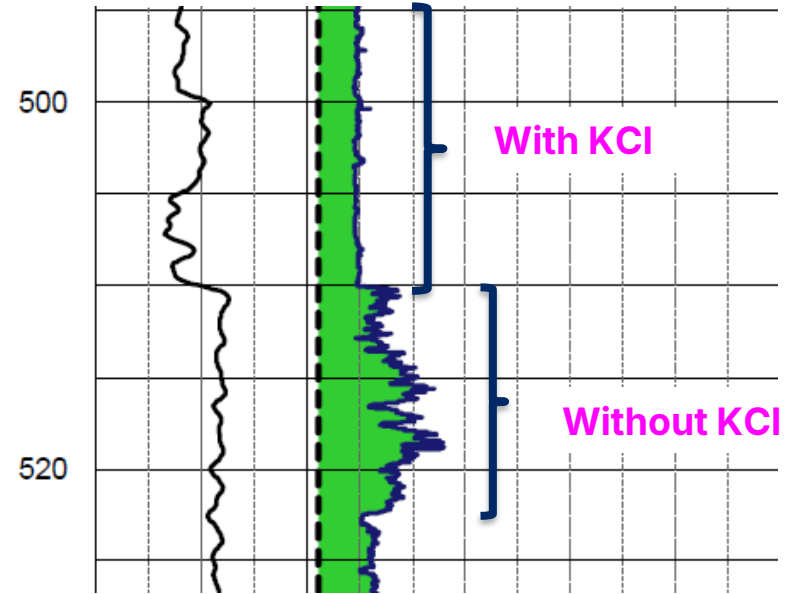
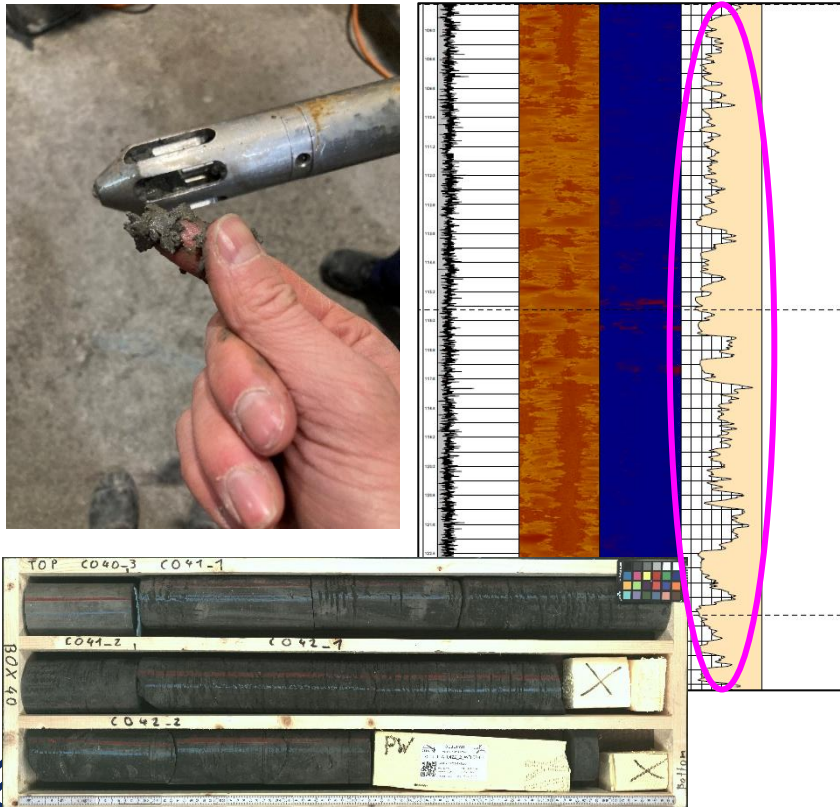
- ❑ **Duration:** 7 – 11 April (24 h shifts)
- ❑ **Drilled depth:** 421 m – 557 m

- ❑ **Drill mud:** pure bore (50:50) + KCl
- ❑ **Diameter:** HQ (63.5 mm cores)

- ❑ **Completion:**
reaming, casing, cementing
- ❑ **Logging:** full programme
- ❑ **Tests:** none

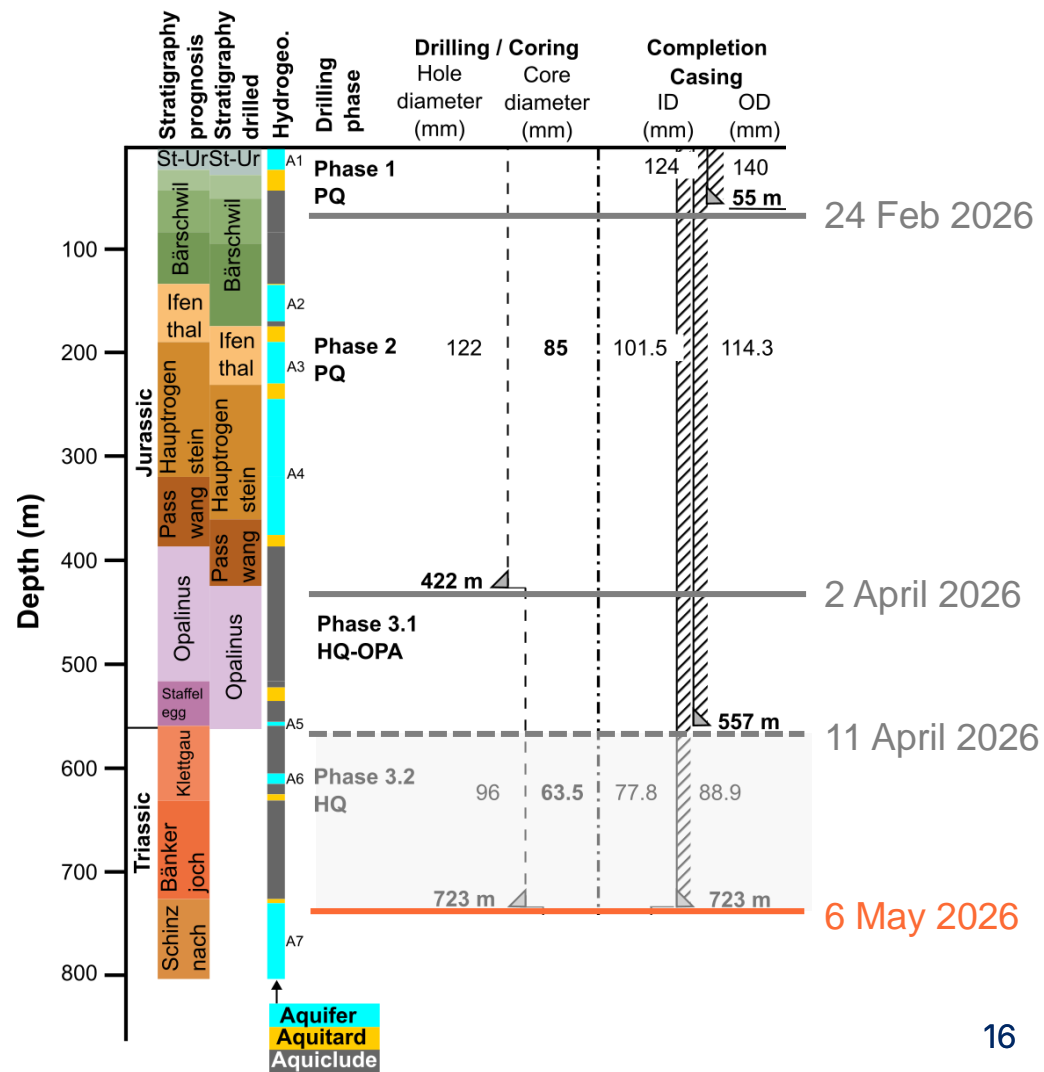


Borehole stability in Rengerri Mb and OPA



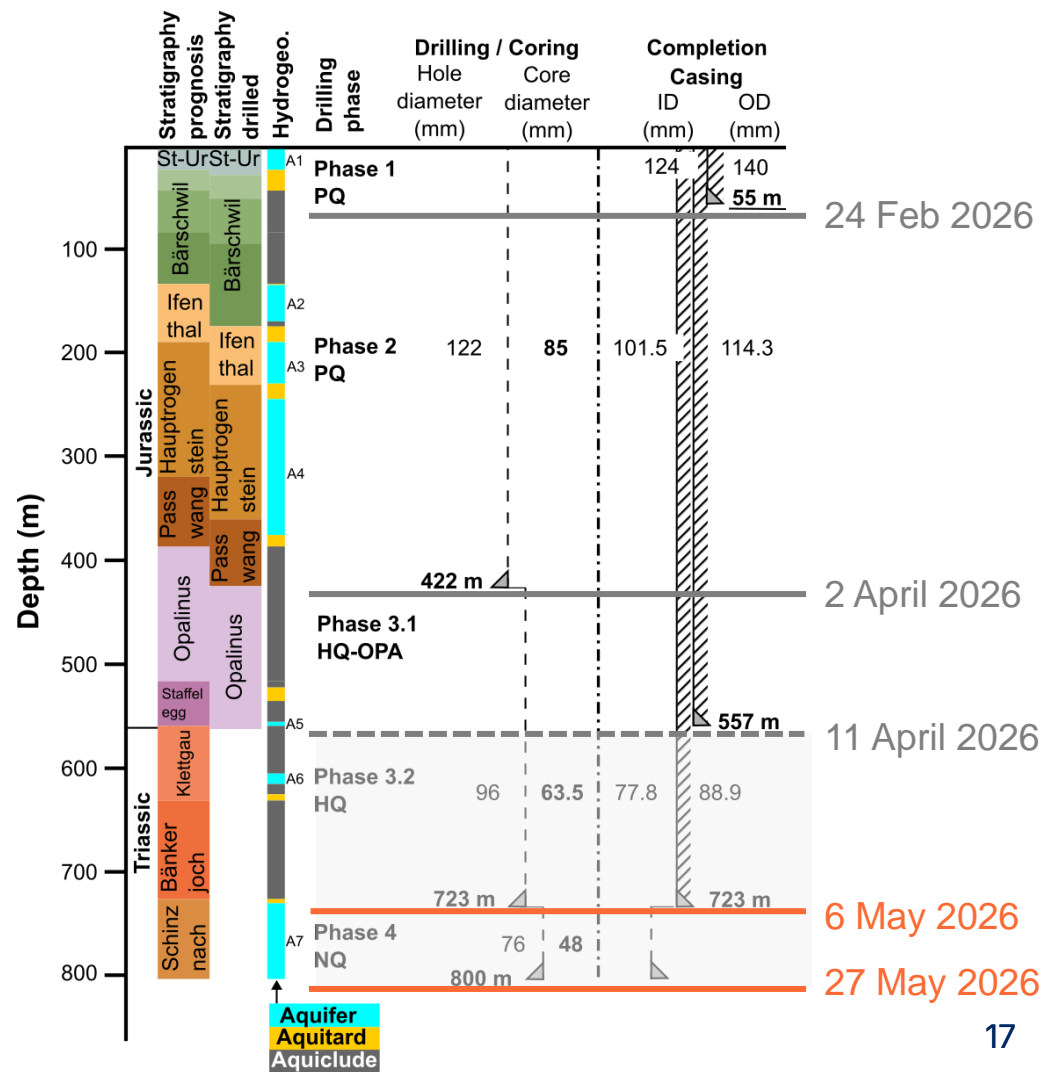
Drilling of section 3.2

- ❑ **Duration:** 25 April 2026 - ?
- ❑ **Depth:** 557 m – 763 m
- ❑ **Drill mud:** pure bore (50:50) + KCl
- ❑ **Diameters:** HQ (63.5 mm cores)
- ❑ **Completion:** casing, cementing
- ❑ **Logging:** full programme
- ❑ **Tests:** hydrotests, HF



Drilling of section 4

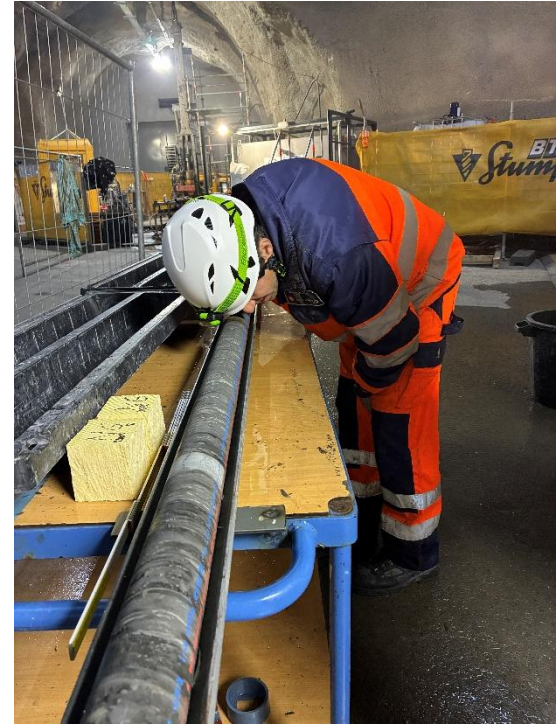
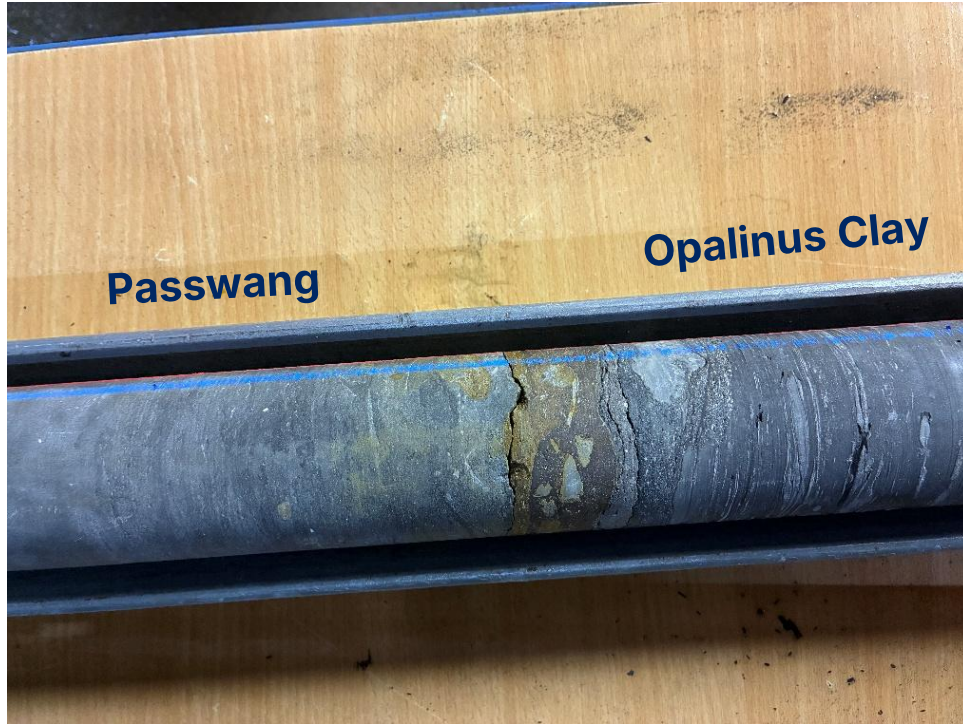
- ❑ **Duration:** ?
- ❑ **Depth:** 763 m – 850 m
- ❑ **Drill mud:** pure bore + INHIBI
- ❑ **Diameters:** NQ (48 mm cores)
- ❑ **Completion:** open hole
- ❑ **Logging:** reduced programme
- ❑ **Tests:** -



Drilling also often means patience ...



Transition OPA reached at 421 m (2. April)

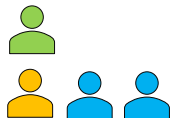


Base of OPA reached at 550 m Transition into Rietheim Mb at 557 m



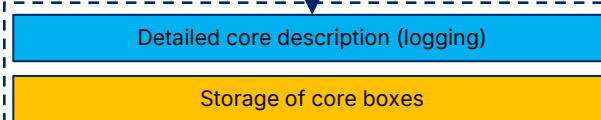
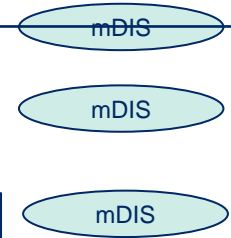
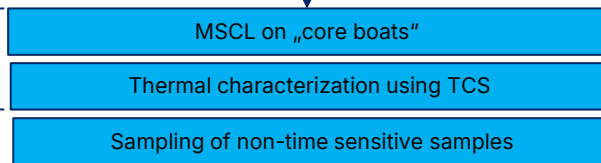
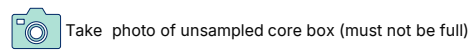
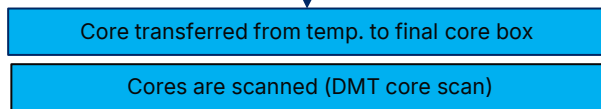
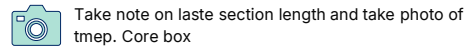
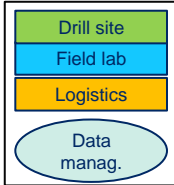
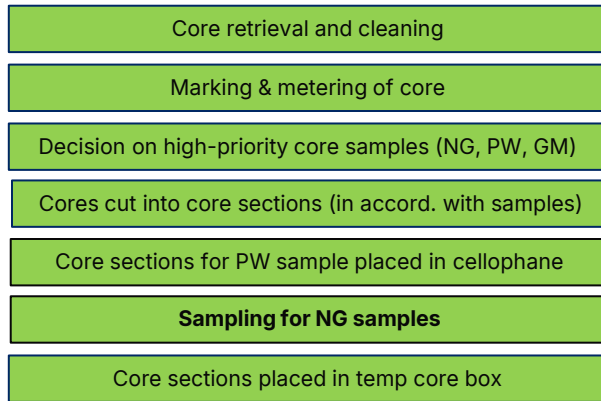
Workflow Scenario

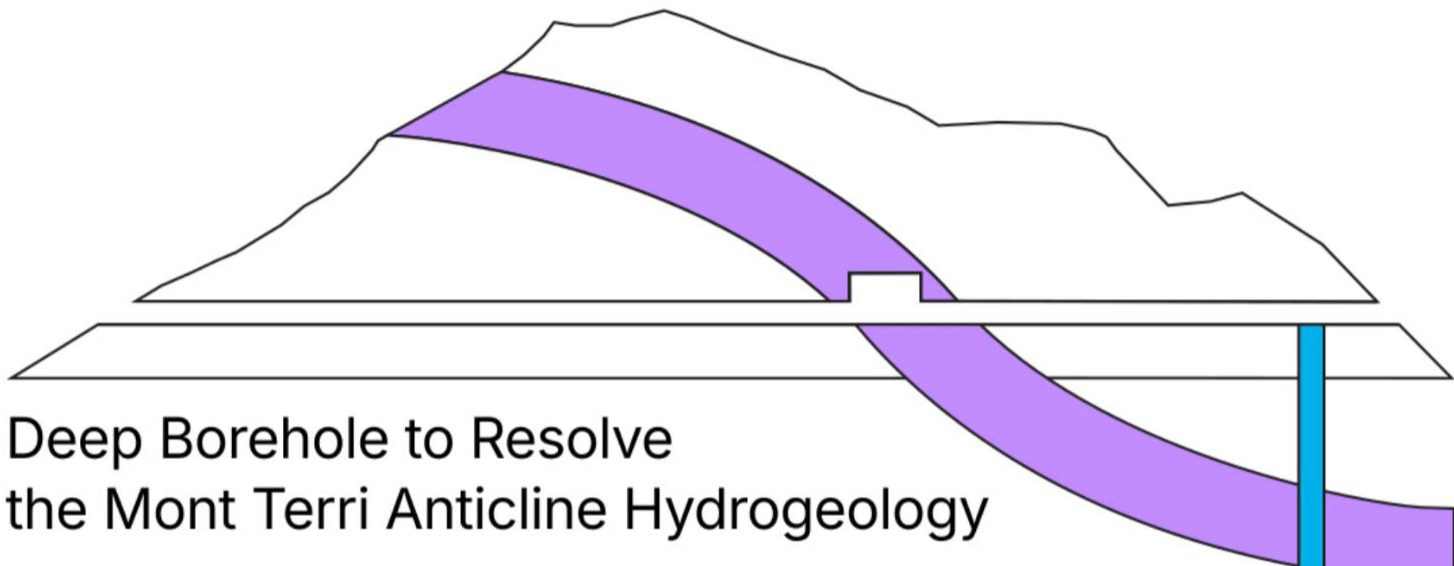
On-site teams:



Afternoon shift

At later stage, when enough core material has accumulated





Deep Borehole to Resolve
the Mont Terri Anticline Hydrogeology

DEBORAH

Merci beaucoup!

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