

Quality assurance of engineered barriers in underground waste disposals

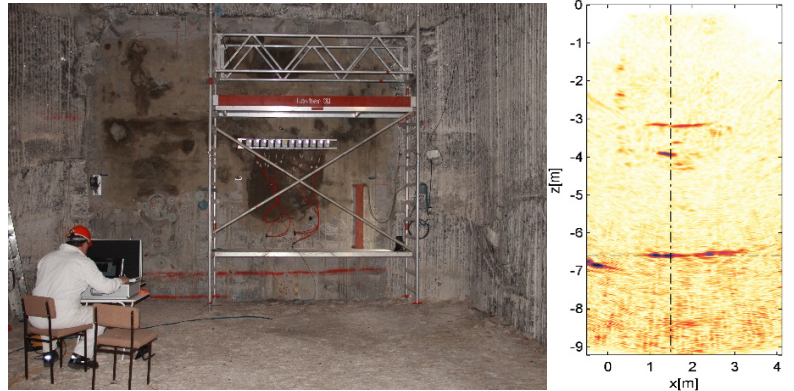
2015 - 2018: Ultrasonic investigation of an engineered test barrier (drift seal) @ ERAM Morsleben: Contract work for BGE.

Engineered test barrier

- „plug“ of salt concrete
- 25 m x 5 m x 5 m
- Pressure experiment successful
- Cracks at surface and at depth

Ultrasonic investigation

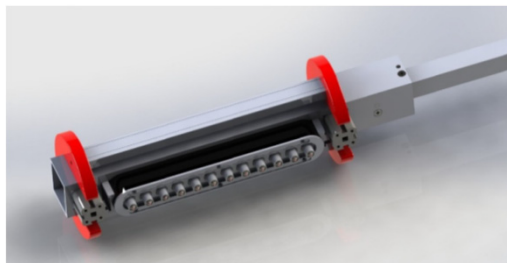
- From surface and boreholes
- Commercial and newly developed instrumentation
- Cracks and other features detected up to depth of 8 m



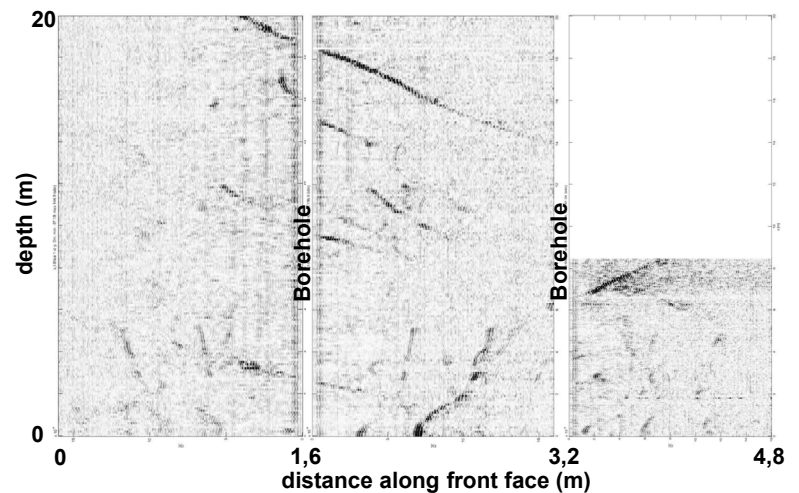
Left: Front face of the test drift seal, data acquisition with the ultrasonic deep penetration system LAUS. Right: crack and object indications detected by LAUS. Contract work for BGE.



Repository ERAM Morsleben (credit: BGE)

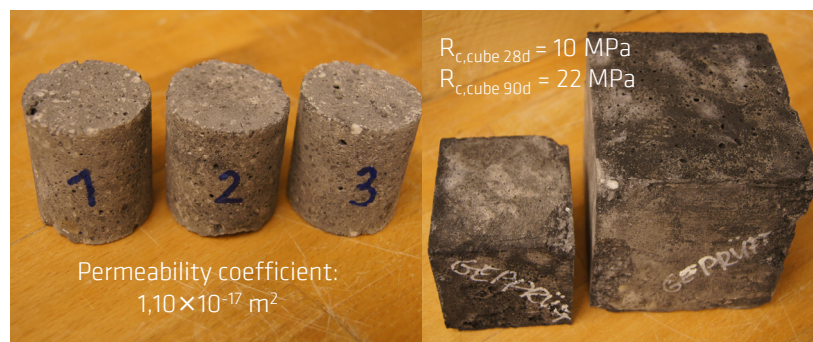


Ultrasonic borehole array (BAM)



Crack indications revealed by ultrasonic measurements in two boreholes at a rock cavity infill (salt concrete). Contract work for BGE

From 2019 (planned) :
BAM thematic project SealWasteSafe



Preliminary experiments with geopolymers using NaCl aggregate:
already close to required parameters!

Idea: New Materials!

- Replacing cement by „Geopolymer“ (Patent pending BAM 7.4)
- No shrinking, low heat development
- No cracking even if poured in large batches
- Low CO₂ Footprint

Research required:

- Material properties
- Optimization
- Quality assurance
- Monitoring

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