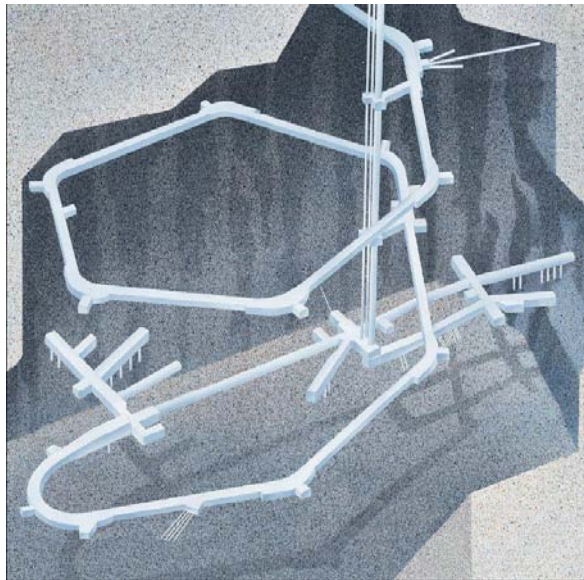


**Blue Ribbon Commission  
on  
America's Nuclear Future  
visits  
Äspö Hard Rock Laboratory**



# **Introduction**

**by**

**Mats Ohlsson**

**Director of Äspö HRL**

**Manager Repository Technology**

# The Stripa Mine Project, 1980-1991

## International cooperation (OECD/NEA)





# The Stripa Mine Project





# Äspö Hard Rock Laboratory

## Background information

- In September 1986 SKB presented the first SKB RD&D (Research Development and Demonstration) programme according to the new Act on Nuclear Activities. One of the major highlights of the programme was the plan for the construction of an underground research laboratory.
- The main aim was to provide an opportunity for research, development and demonstration in a **realistic and undisturbed rock environment** down to the depth planned for the future deep repository.



# Successful decisions

**At the outset of the programme, two important decisions were taken:**

- The use of the laboratory is only for research purposes. **It will not be converted into a repository in the future!**
- Suitable geology, existing infrastructure and service should be available. To begin with, the suitability of one of the nuclear power sites, especially Simpevarp at Oskarshamn should be explored.



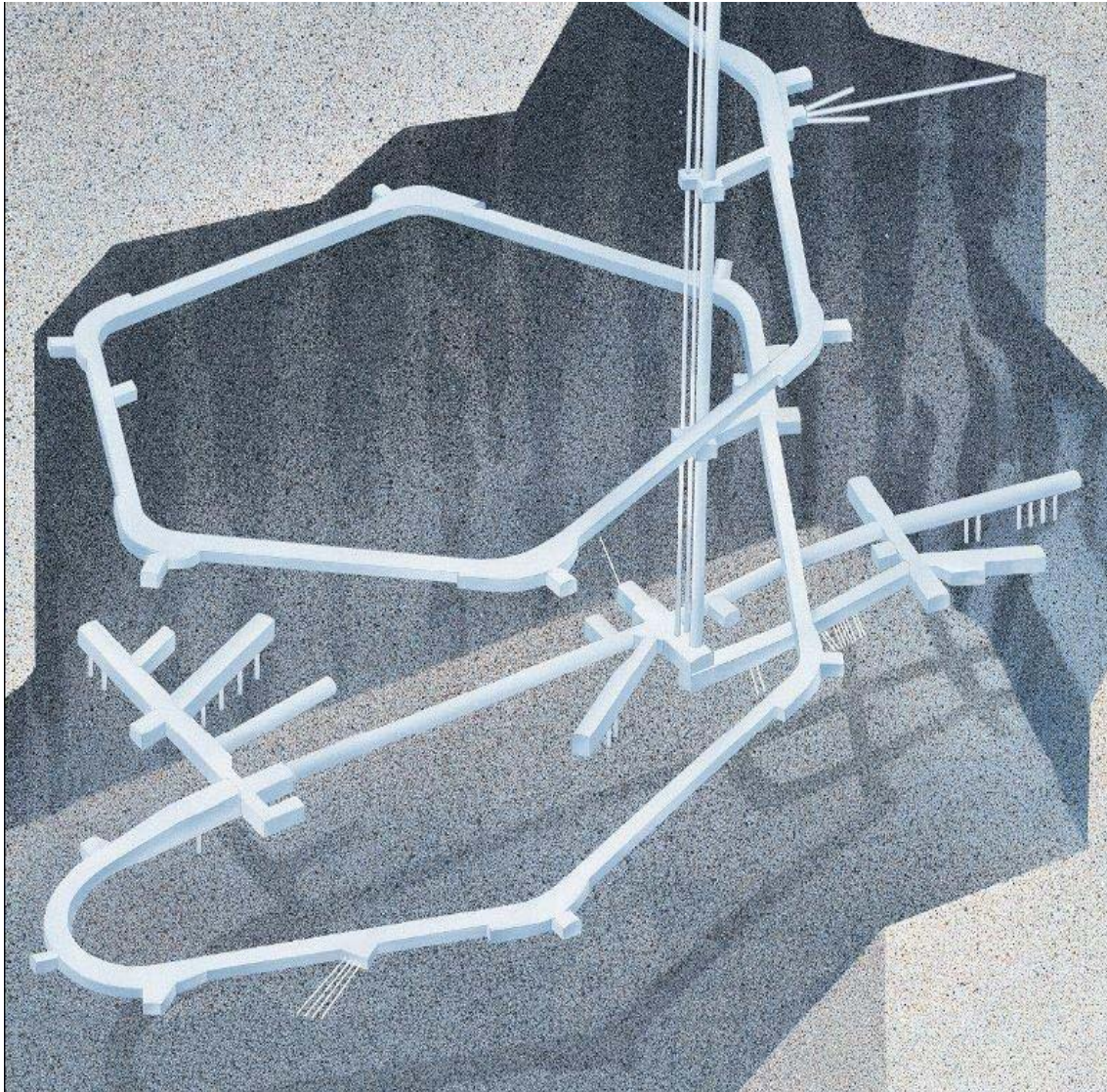
# Location of the laboratory

**The main advantages of locating the laboratory in the vicinity of the nuclear power site at Simpevarp were:**

- the geology of the area was suitable,
- an appropriate infrastructure existed,
- the interim storage facility for spent fuel (Clab) is situated at Simpevarp,
- the transportation ship M/S Sigyn is stationed at the harbour of Simpevarp,
- good information opportunities existed and could be further developed.



# Äspö Hard Rock Laboratory, 1986-





# Äspö HRL - History

## **Preconstruction Phase, 1986-1990**

- Regional geological investigations
- Surface and borehole investigations
- Predictions

## **Construction Phase, 1990-1995**

- Evaluation of predictions
- Methodology for detailed characterisation
- Modelling of groundwater flow

## **Operating Phase, 1995-**

- Test models describing the barrier function of the rock
- Demonstrate technology and function of the repository system

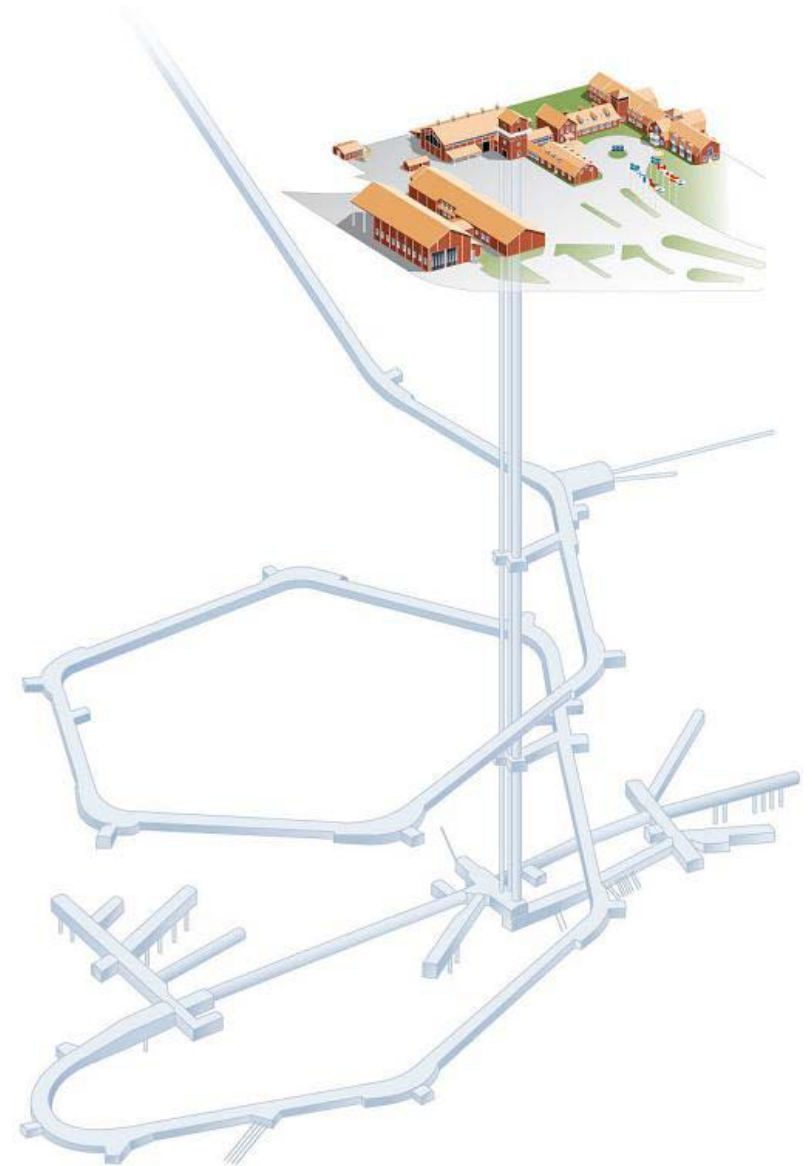


# The role of the Äspö HRL

- ✓ Develop and demonstrate methods for construction and operation of the final repository
- ✓ Test alternative technology that can improve and simplify the design of the final repository without compromising its high quality and safety
- ✓ Increase the scientific understanding of the safety margins and provide realistic data for safety assessments of the long-term safety of the repository system
- ✓ Provide experience and train personnel for various tasks in the final repository
- ✓ Provide information to the general public on technology and methods that are being developed for the final repository

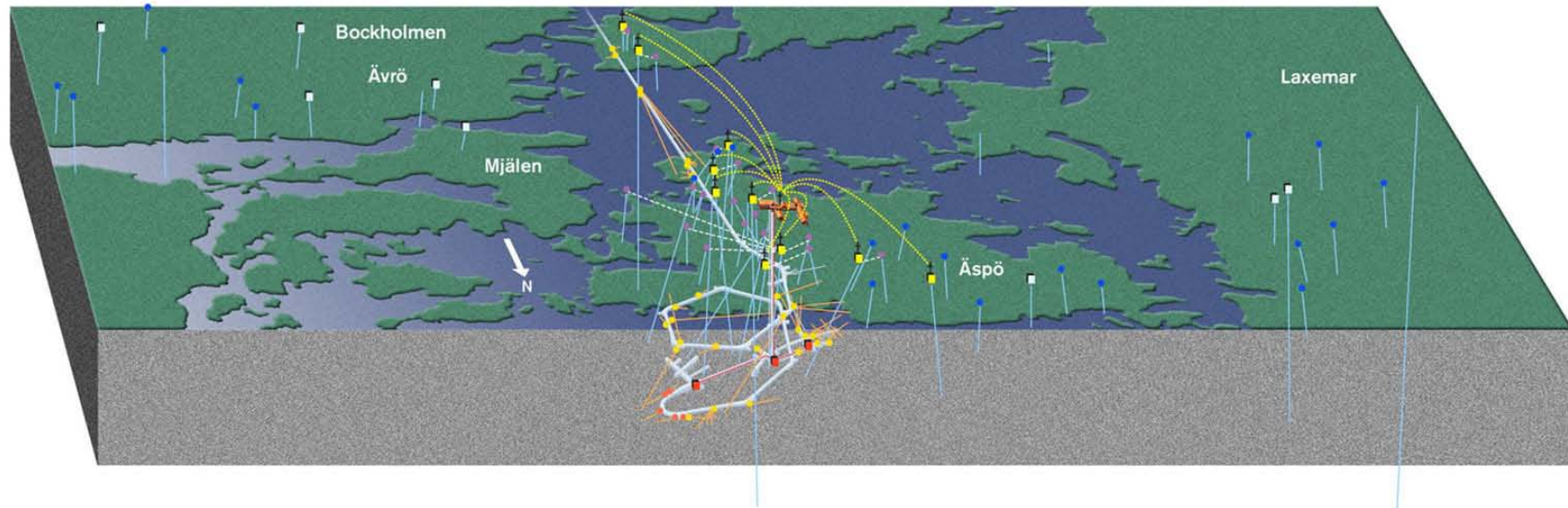
# Äspö HRL Facility, some facts

- Office space for more than 100 persons
- Main experimental area between the 220 and 450 m levels and it can be reached by the access ramp or by the elevator.
- On-line hydro-monitoring system
- Hydrochemistry Laboratory
- Bentonite Laboratory
- Exhibition Hall

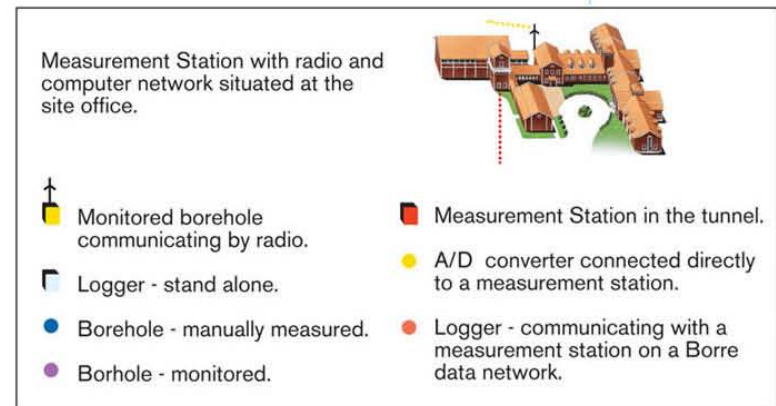




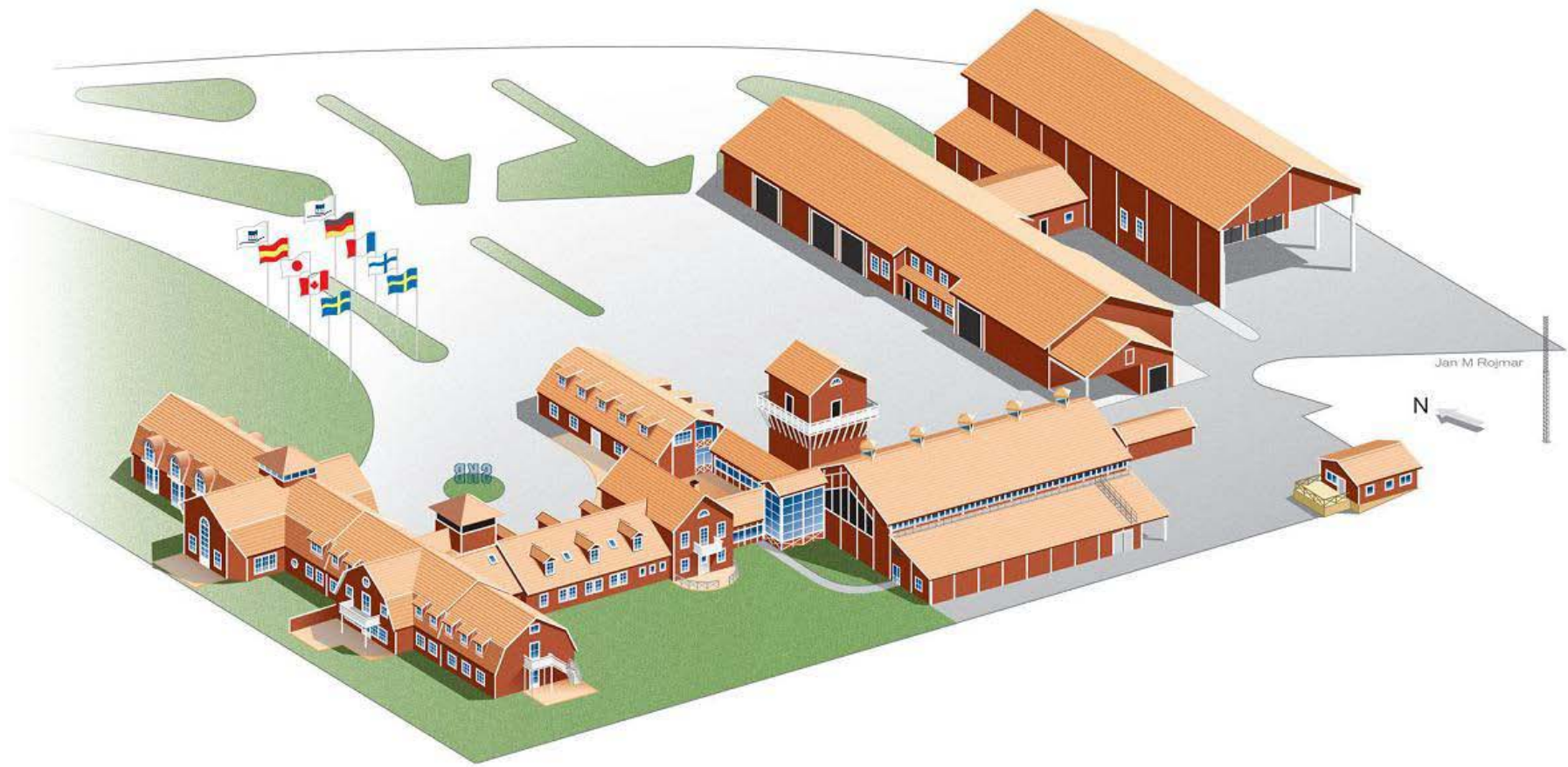
# Äspö HRL Hydro Monitoring System



The Hydro Monitoring System (HMS) at Äspö Hard Rock Laboratory. The Äspö area with borehole locations and Äspö HRL with access ramp, the tunnel spiral and boreholes. Surface part of the HMS showing the data logger network and radios in surface boreholes and the tunnel boreholes.

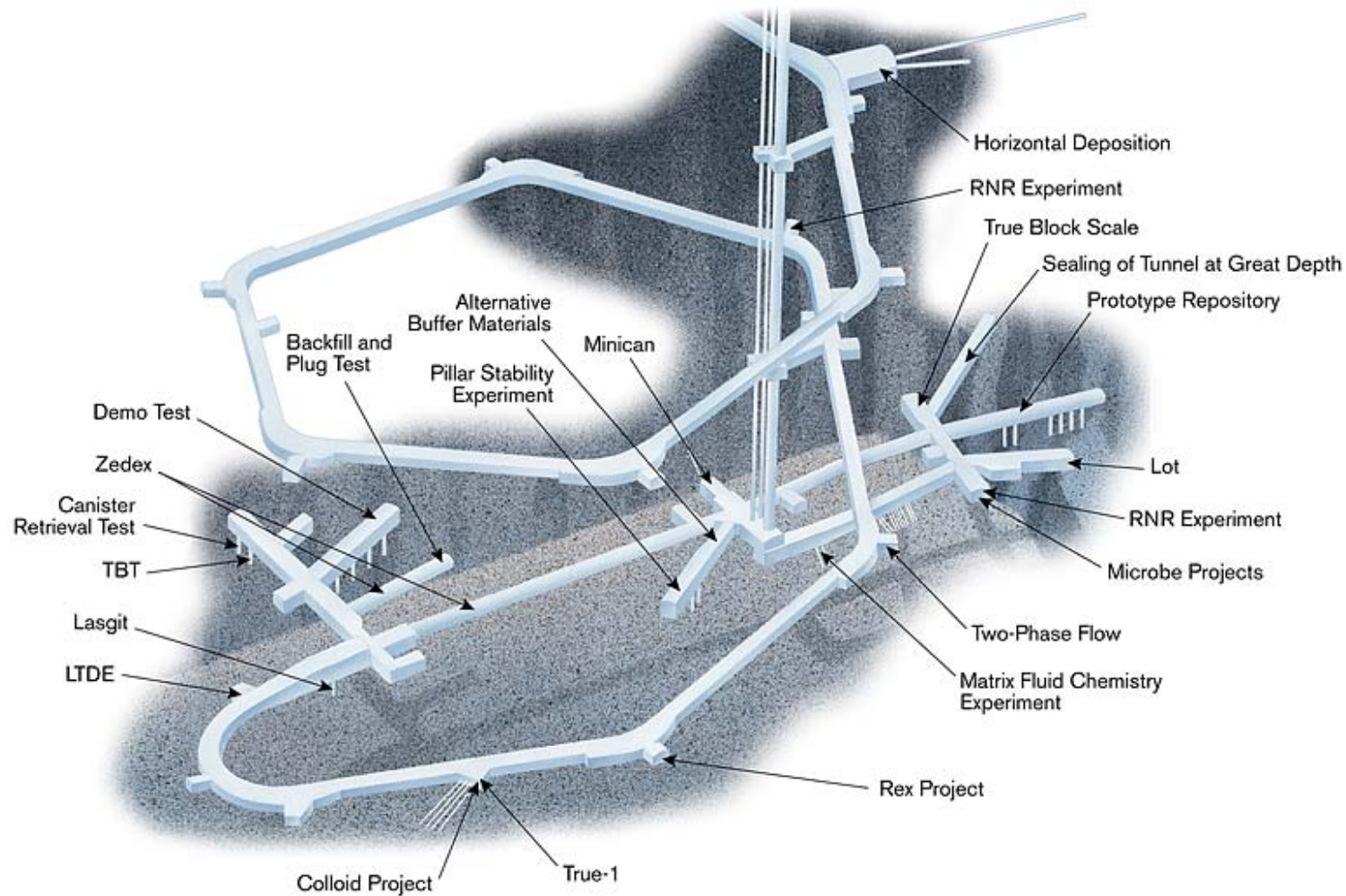


# Äspö Hard Rock Laboratory above ground



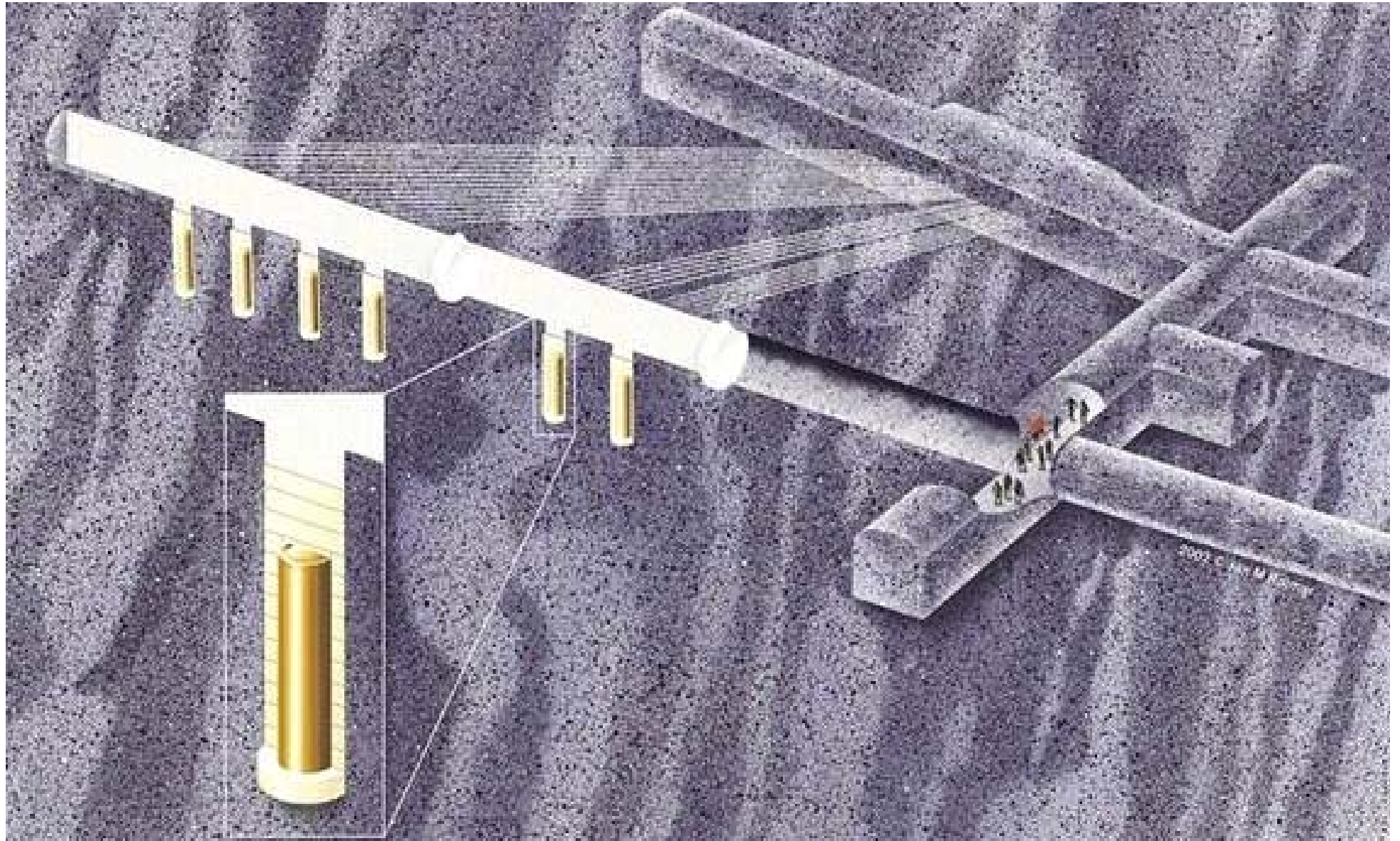


# Äspö Hard Rock Laboratory Experiments





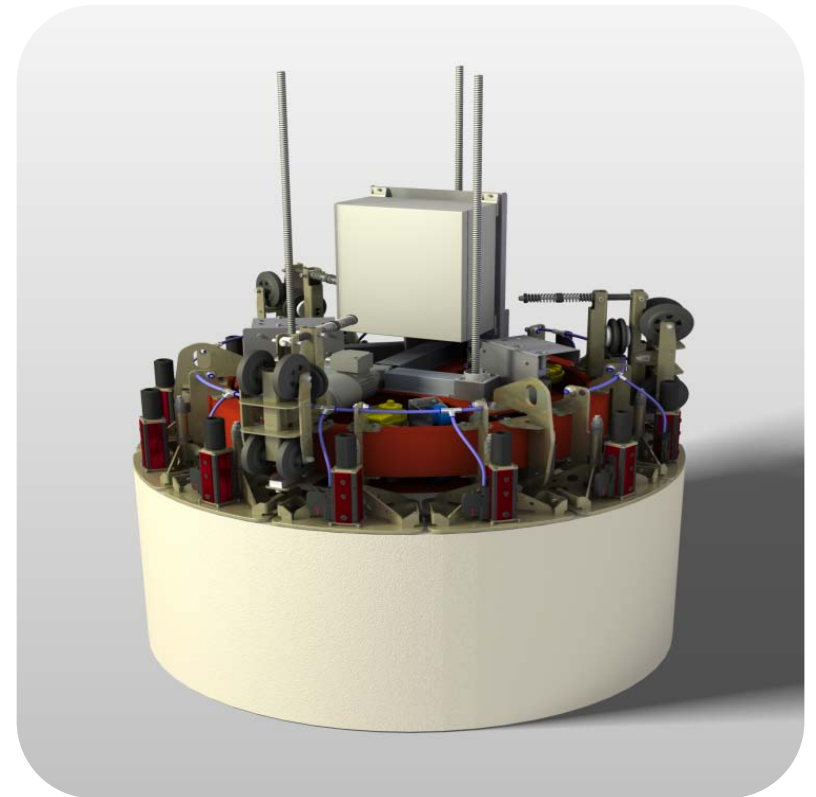
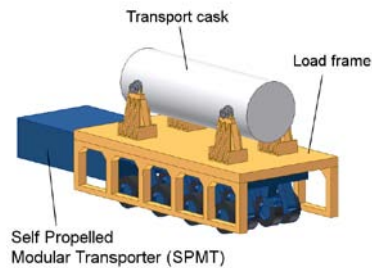
# Prototype Repository



# Deposition machine, KBS-3V



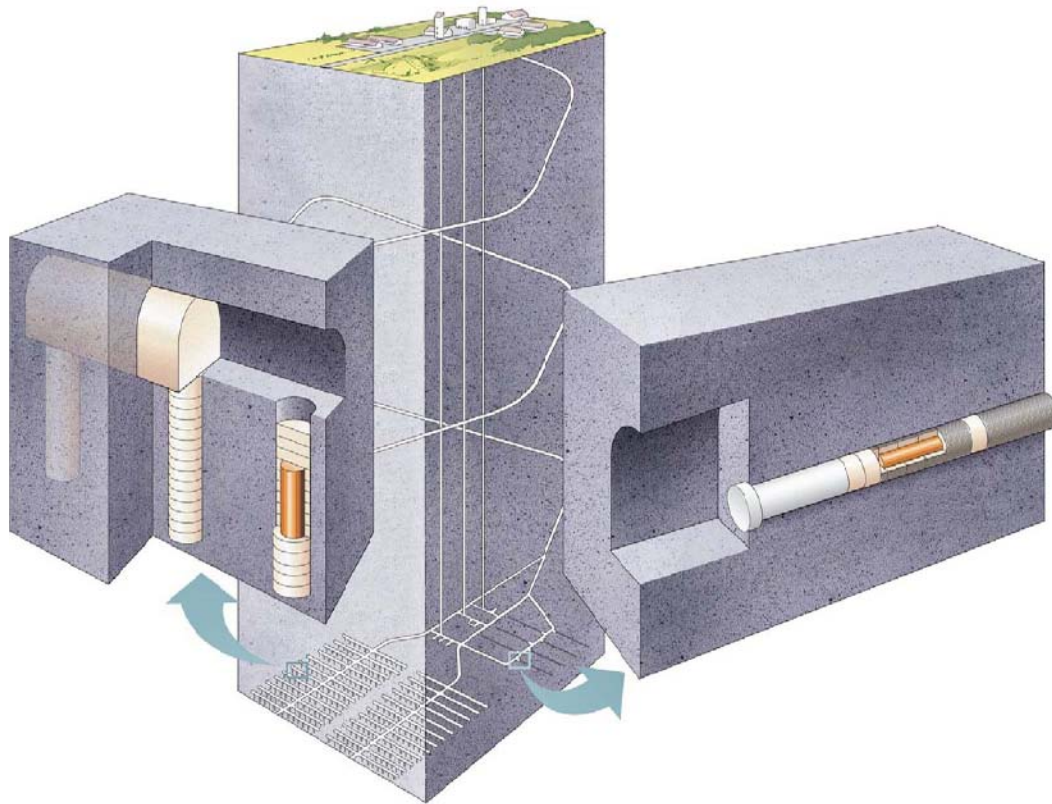
# Examples of other vehicles/equipments





# KBS-3H

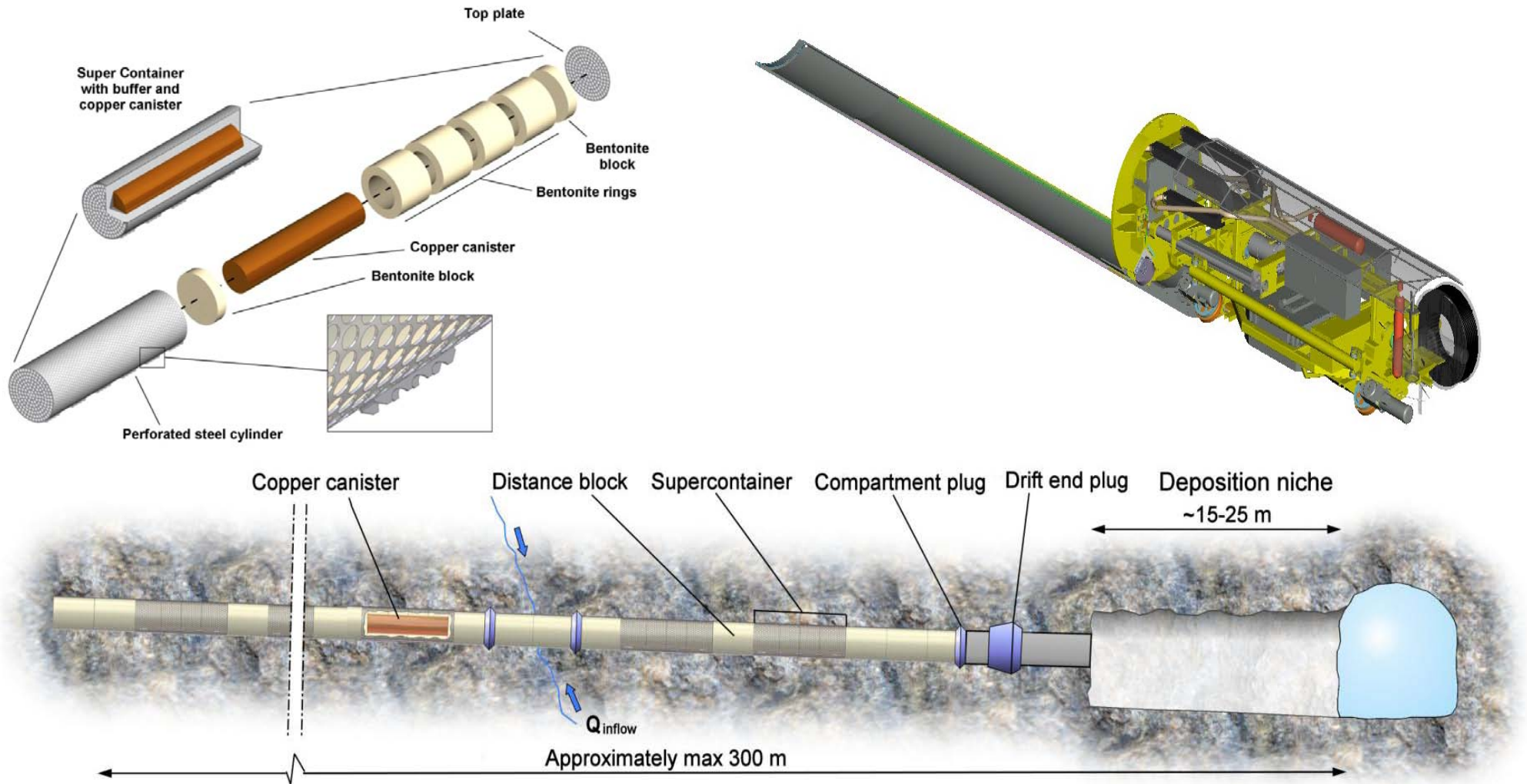
## Horizontal emplacement of canisters



- KBS-3H is estimated to be a more efficient disposal method compared to KBS-3V
  - Reduction in rock excavation and backfilling
  - Less environmental impact during construction
  - Reduced disturbance on the rock mass during construction and operation
- Quality aspects
  - Prefabricated disposal container enables an easier quality assurance of the canister near zone

# KBS-3H

## Horizontal emplacement of canisters



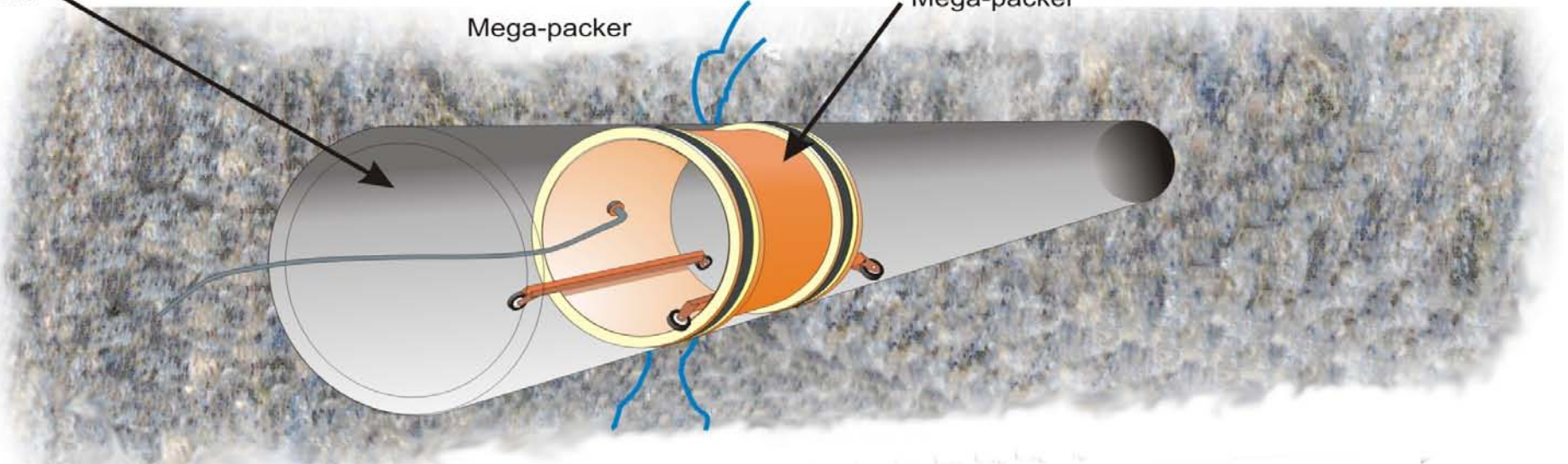




Drift

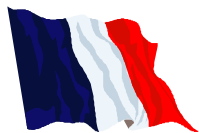
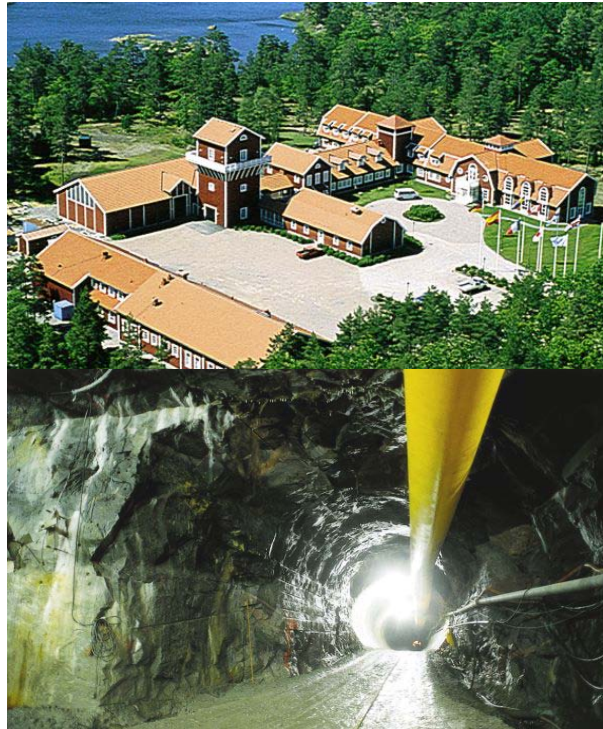
Mega-packer

Mega-packer





# Äspö HRL International co-operation

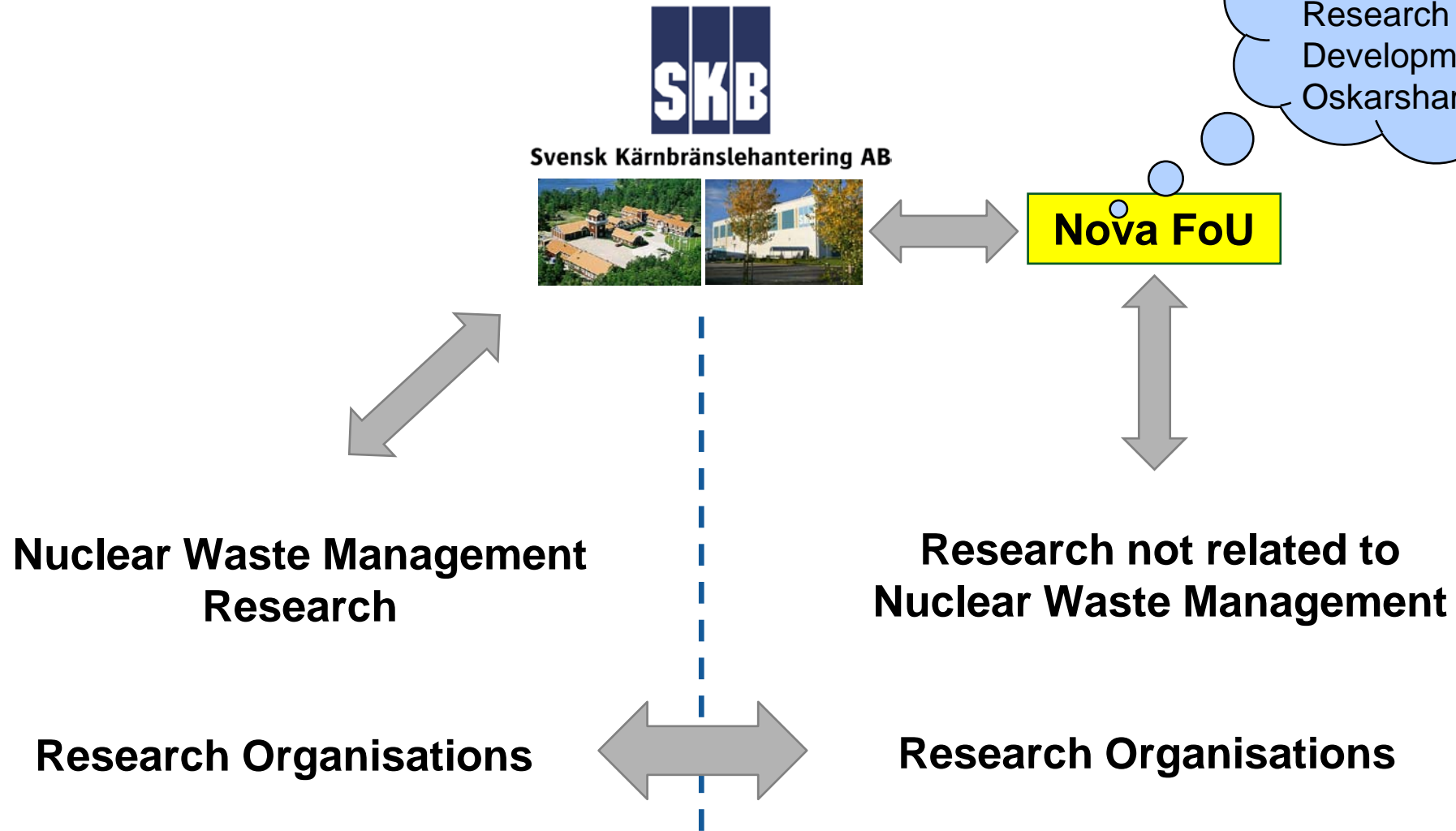


# Public Relations and Visitor Services

- ❖ About 10 000 visitors yearly
- ❖ 15 % of the visitors are coming from countries world wide
- ❖ “Urberg 500” - Summer-tours for the general public in co-operation with the tourist agency in the city of Oskarshamn.



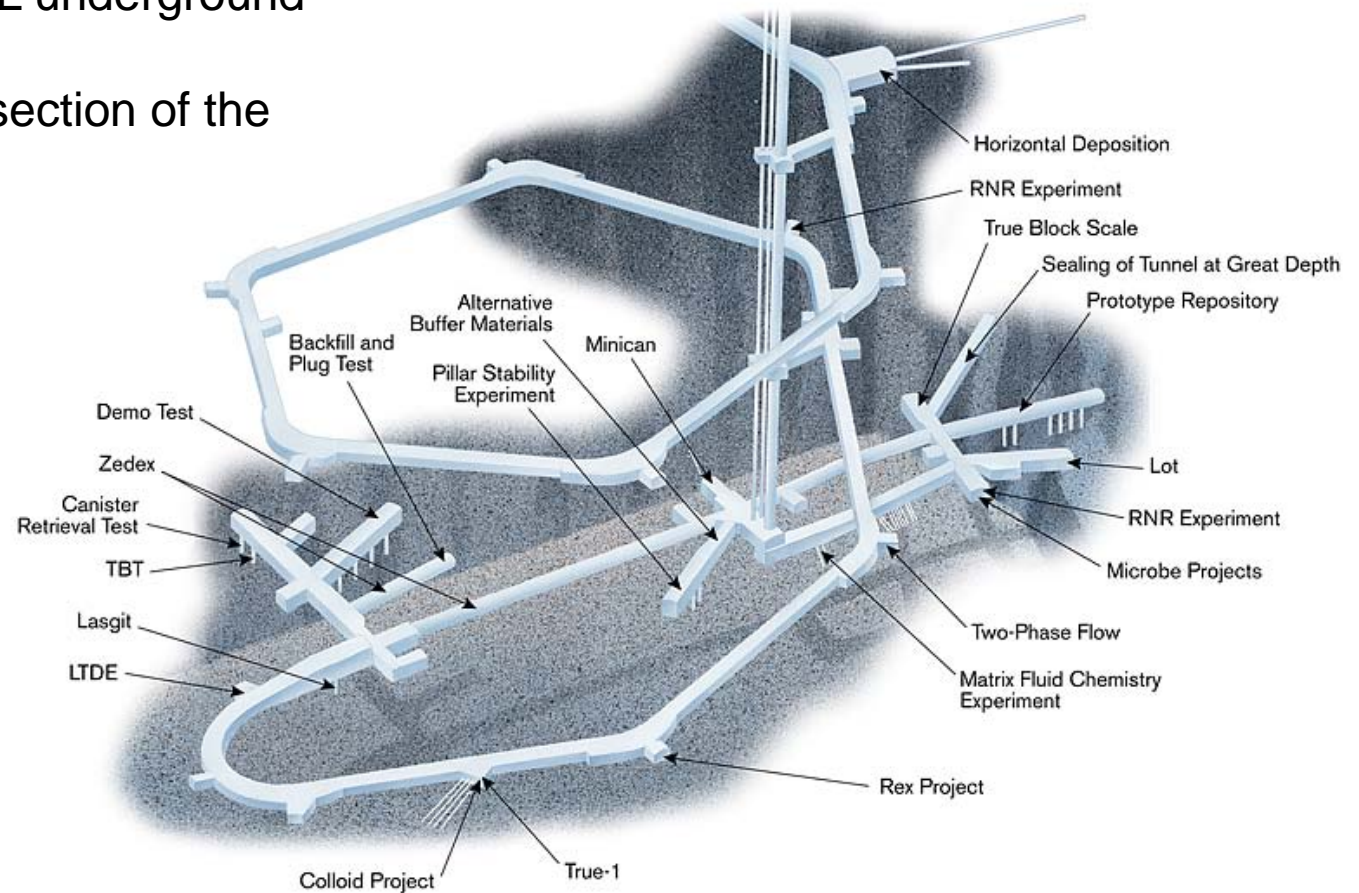
# Nova Research and Development (Nova R&D)



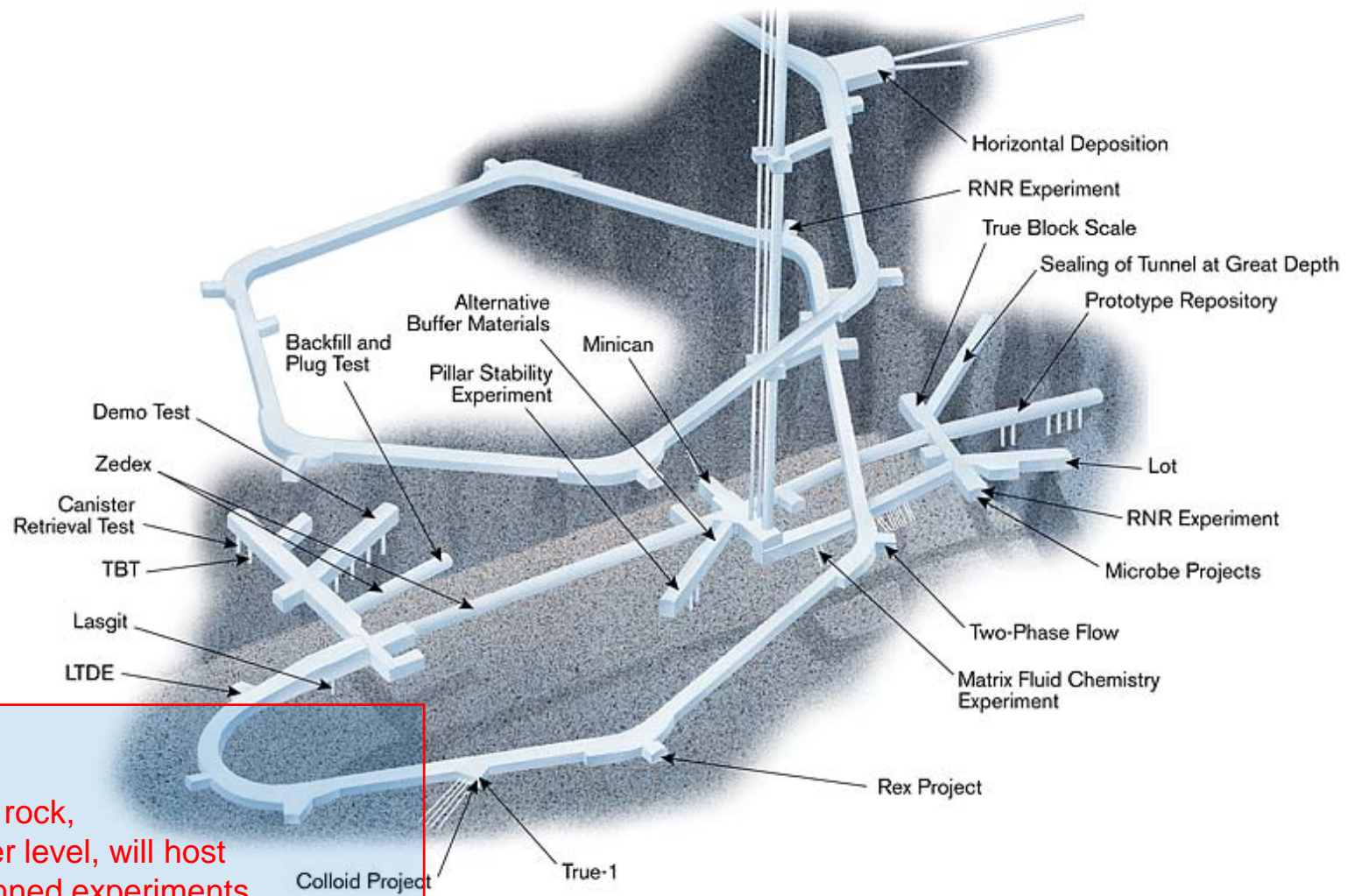


# Main activities during 2011

- Enlargement of Äspö HRL underground
- Dismantling of the outer section of the Prototype Repository

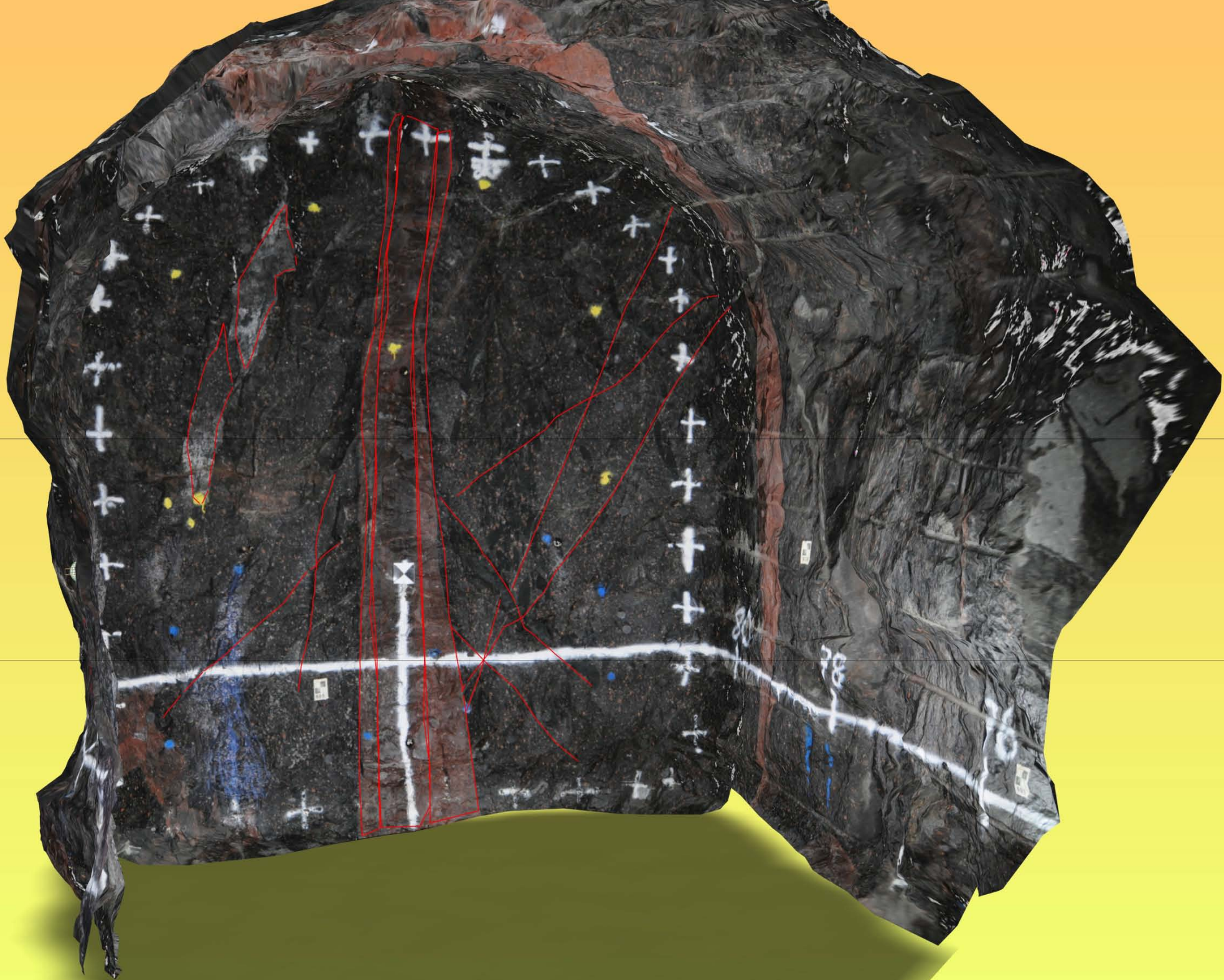


# Enlargement of Äspö HRL 2011

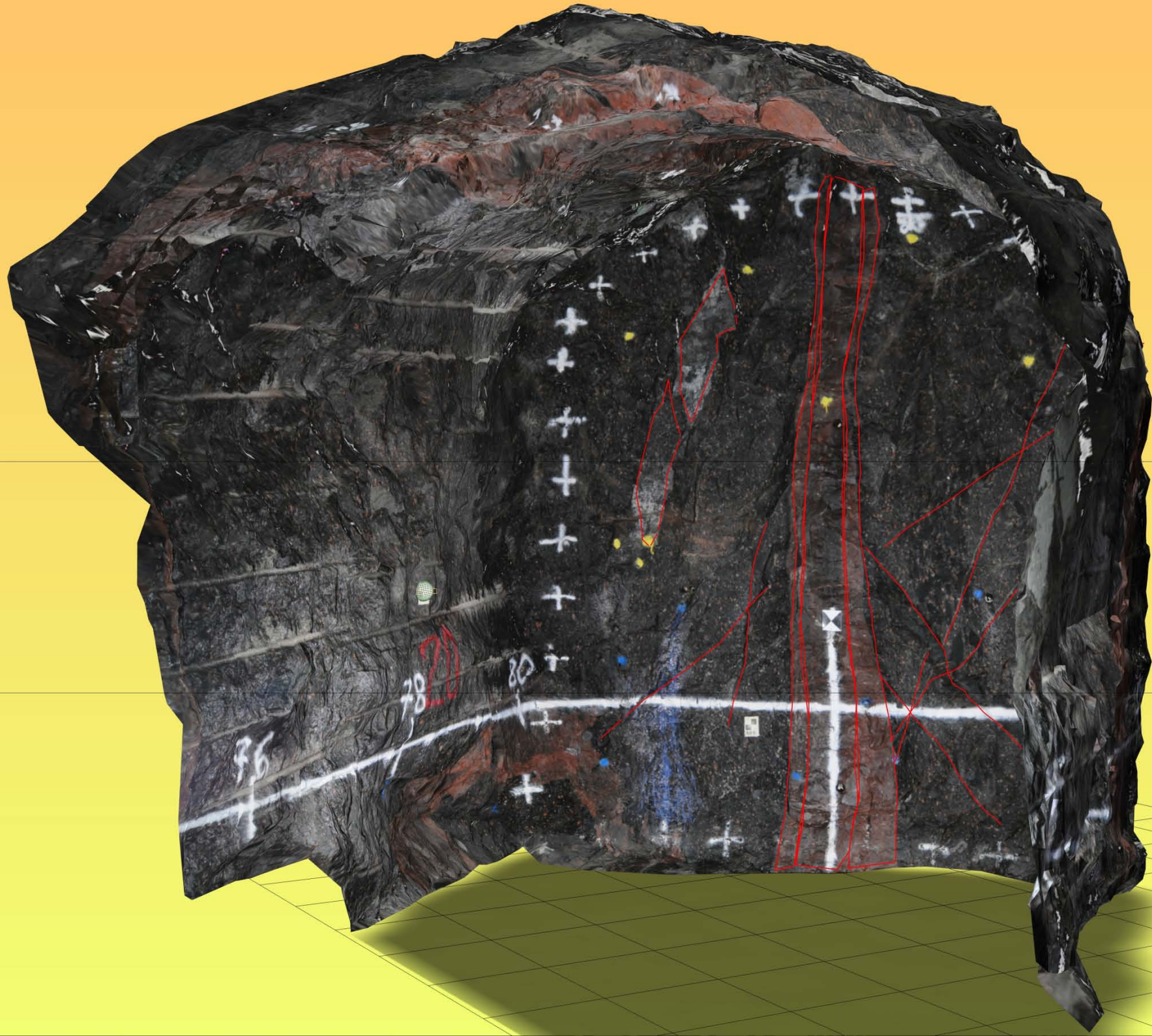


This part of the rock, at the 420 meter level, will host the coming planned experiments.

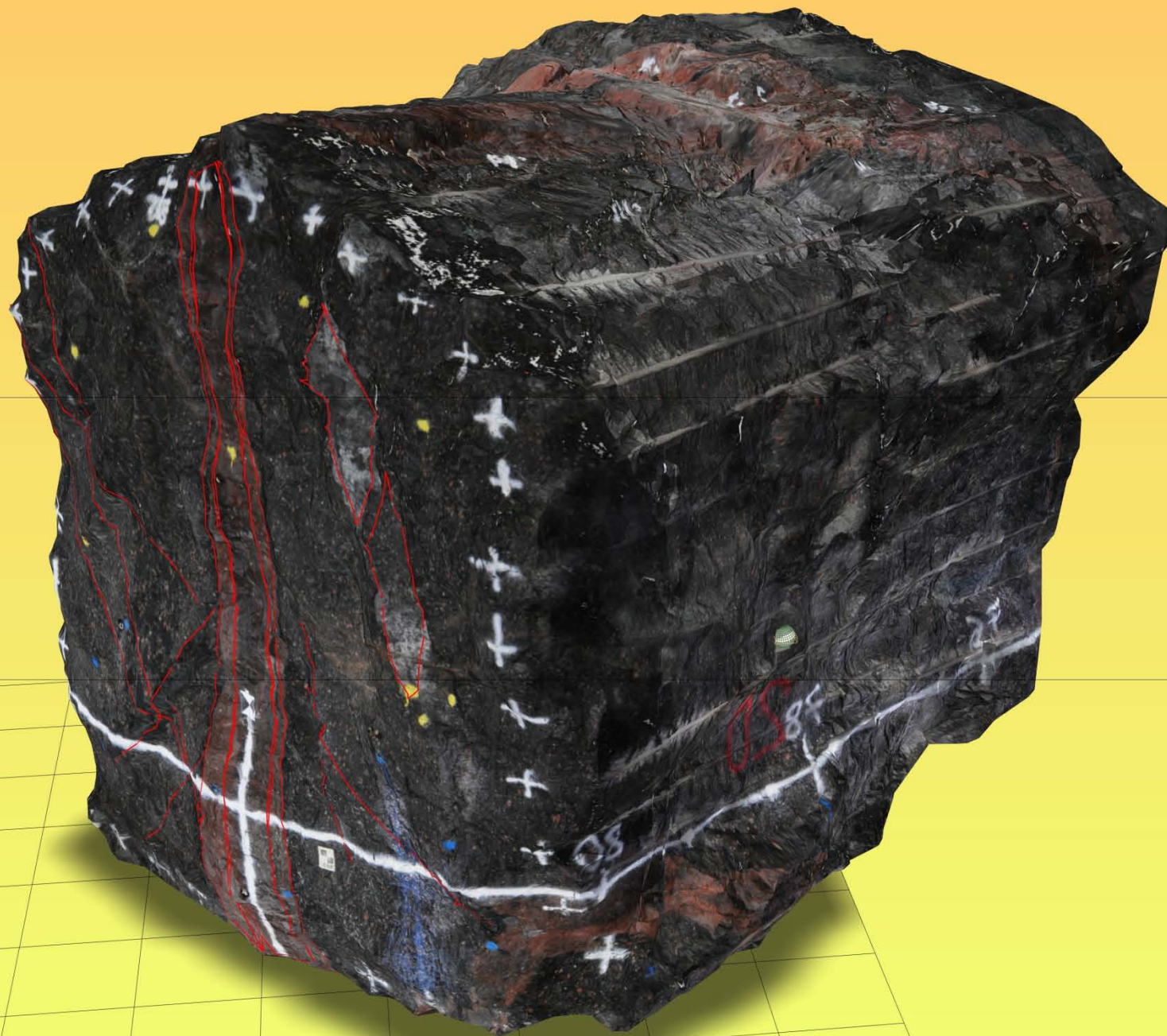






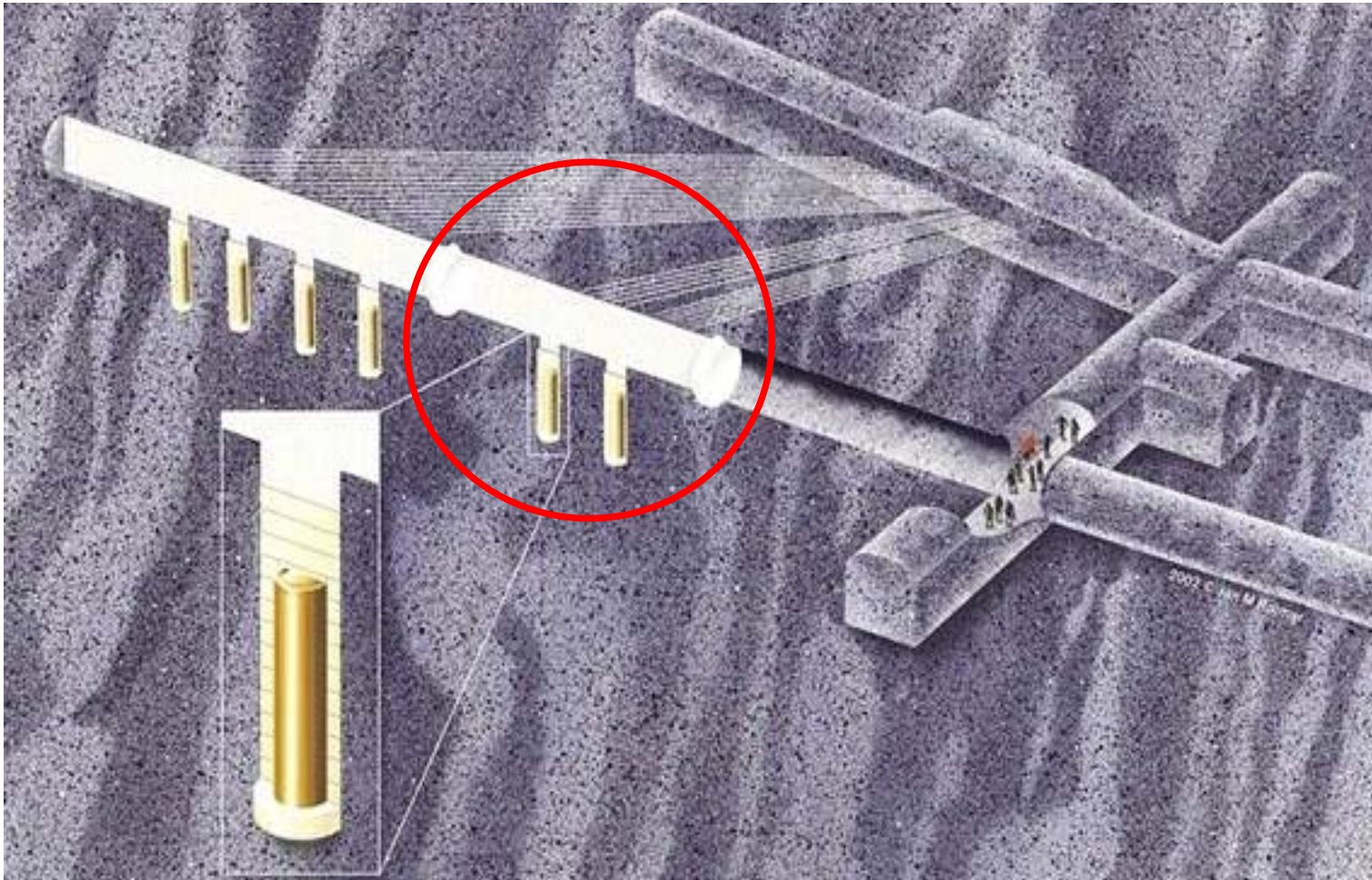








# Dismantling of the outer section of the Prototype Repository





















# Äspö – An unique island in the Archipelago of Misterhult



**Thank you for your attention!**