

ASPECTS OF DEEP BOREHOLE DISPOSAL THAT ARE OF SPECIAL INTEREST TO CIVIL SOCIETY

ASTRA 3+1 Workshop
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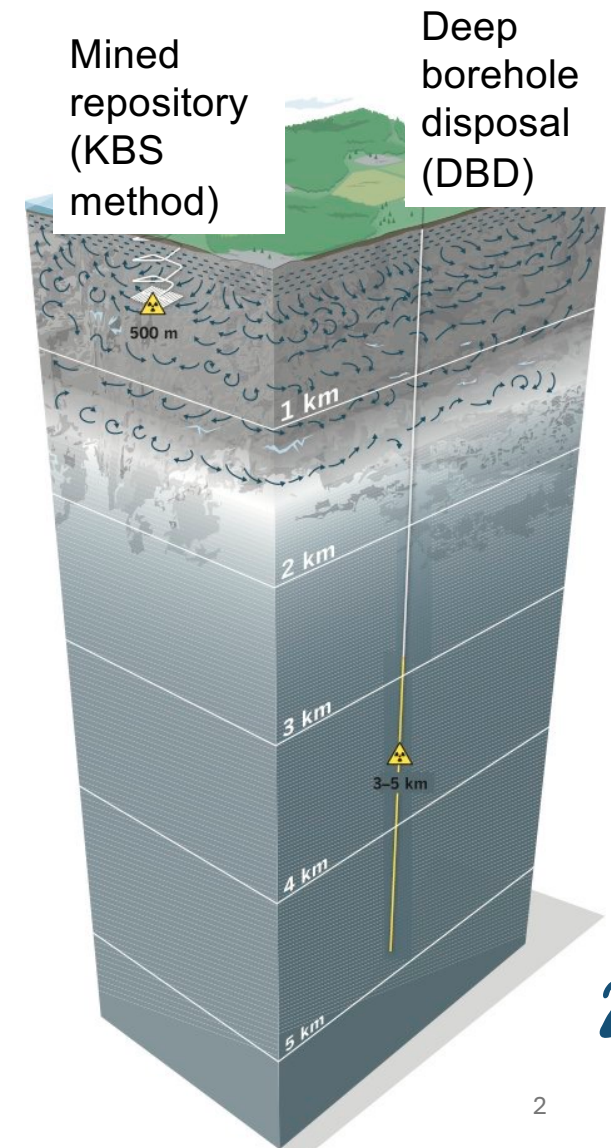
Co-funded by the European Union under Grant Agreement n° 101166718

27-29 May 2026

ASTRA 3+1 Workshop Ljubljana

WHY AN INTEREST IN DEEP BOREHOLE DISPOSAL (DBD)?

- In the alternative method deep borehole disposal (DBD) nuclear waste is disposed of in a borehole at between 3-5 km depth, perhaps slightly less deep.
- The long-term environmental safety case is likely strong and based on a “natural barrier” that isolates stagnant groundwater at disposal depth from flowing ground water down to 1-1,5 km depth.
- The method has a lower long-term physical security/nuclear proliferation risk (for spent nuclear fuel) due to less risk of intentional human intrusion.
- Likely DBD will also be less expensive than mined repositories.
- Feasibility has increased over time with development in drilling and “emplacement” technology.
 - Around the year 2000 the natural barrier function was verified
 - By 2010 the technical feasibility of drilling and deposition was “confirmed”
 - An advanced pilot DBD project was started in the USA during the Obama administration, stopped due to siting problems (and Trump administration interest in Yucca Mountain)
 - Presently possible increased interest (?????) within the EU (EURAD) and internationally (IAEA), shared facilities (ERDO), USA



SOME CIVIL SOCIETY ISSUES

- What are the main barriers to implementation and are there a ways forward?
 - Inertia and vested interest in mined repository projects
 - Lack of a strong implementor interest
- How robust is the safety case?
 - What are the hydrogeological conditions at depth (stagnant?)?
 - High salinity and heat → canister not part of the safety case (like mined clay repositories)
 - Criticality issues for spent nuclear fuel
- Are there operational risks?
 - Stuck canisters, dropped canisters
- How do you deal with reversibility, retrievability and recoverability during operation and pre-closure?
 - Is 100 years possible before final closure?
- How to view low long-term retrievability compared to low risks of intrusion?
 - Less need for long-term governance and intergenerational stewardship

