

nagra.

THE SITE FOR THE DEEP  
GEOLOGICAL REPOSITORY  
Nagra's Proposal

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## WHAT IS AT ISSUE?

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### THE TASK

This is a national task: the long-term, safe disposal of radioactive waste in Switzerland. Most of the waste is produced by the nuclear power plants but some arises from applications in medicine, industry and research.

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### THE SOLUTION

Experts worldwide agree that a deep geological repository is the safest option for the long-term disposal of radioactive waste. For this reason, this solution is anchored in Swiss legislation. A deep geological repository consists of drifts and caverns located deep underground. Engineered barriers such as steel canisters and geological barriers such as rock formations will enclose the waste over a very long time period. The most important barrier is the tight rock in which the repository will be constructed, i.e. the host rock. In Switzerland, the Opalinus Clay is most suitable as a host rock.

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### THE SEARCH FOR A SITE

The Federal Government has had the lead in the site selection process since 2008. Starting with the whole of Switzerland, less suitable regions and rock formations were excluded in a multistage process. In 2018, the Federal Council determined that Nagra should investigate three regions in greater detail: Jura Ost, Nördlich Lägern and Zürich Nordost. Nagra has carried out this work and is therefore now in a position to propose the site for a deep geological repository.

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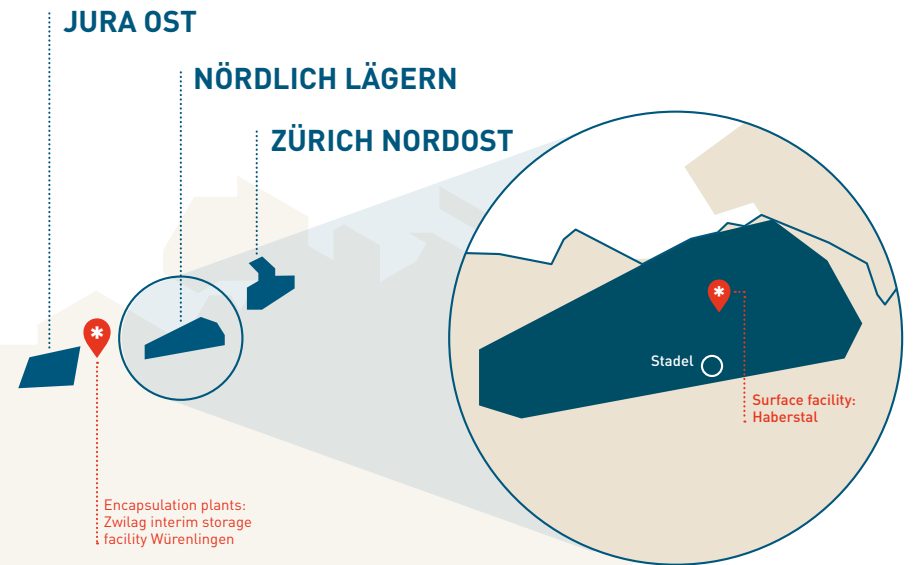
### THE SITING PROPOSAL

Nördlich Lägern has the largest safety reserves and is, in Nagra's opinion, the most suitable site for a deep geological repository for all of Switzerland's radioactive waste. Together with the region and Canton Zürich, Nagra has determined the site for the surface facility: the Haberstal area in the community of Stadel. The encapsulation plants for the waste are to be constructed at the Zwilag interim storage facility in the community of Würenlingen.

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### THE NEXT STAGE

The scientific and technical foundations have been developed and Nagra will now prepare the general licence applications and submit these to the Federal Government around two years from now. The Swiss Federal Nuclear Safety Inspectorate and other experts will review the applications. Based on this, the Federal Council will make its decision, followed by the Swiss Parliament and, in case of a referendum, the Swiss voters.



## WHY NÖRDLICH LÄGERN IS THE SAFEST SITE

All three siting regions fulfil the requirements for the construction of a repository, but the Nördlich Lägern siting region is the most suitable. Nagra has investigated the three regions based on regulatory requirements and has identified three relevant differences that are decisive in selecting the site:

### QUALITY OF THE GEOLOGICAL BARRIER

A large distance between the Opalinus Clay and the nearest water-bearing rock layer contributes to the containment of the waste. In addition, ancient porewater in the Opalinus Clay, i.e. porewater that has been enclosed in the rock over a very long time, indicates a highly effective containment capacity – in other words, a good barrier. The Opalinus Clay in Nördlich Lägern has the greatest distance to the nearest water-bearing rock layer and the oldest porewater.

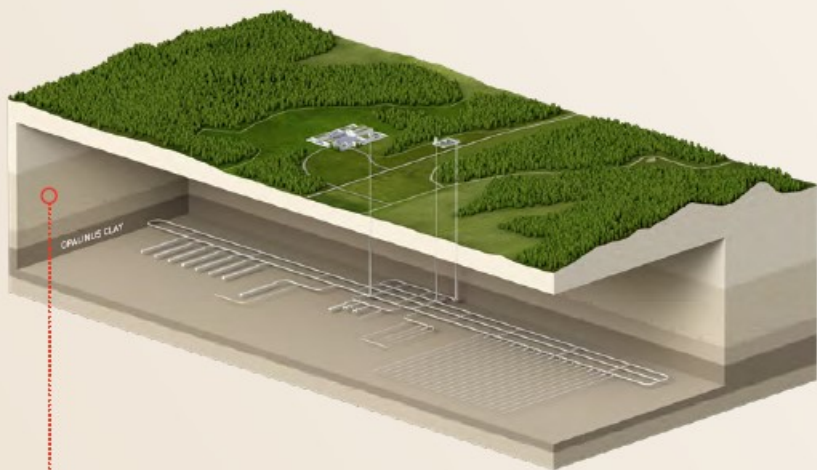
### STABILITY OF THE GEOLOGICAL BARRIER

The Opalinus Clay has to safely enclose the waste not only today, but also in the distant future. Natural influences such as erosion by glaciers and rivers can change the landscape at the surface and below ground. The host rock in Nördlich Lägern provides the best protection of the repository from such processes, partly due to its greater depth. As a result, it also ensures the greatest long-term stability.

## FLEXIBILITY

Nördlich Lägern has the largest area suitable for the construction of a deep geological repository, providing Nagra with the greatest degree of flexibility with regard to the layout.

From Nagra's point of view, the Nördlich Lägern siting region has the best overall safety reserves and is therefore the most suitable region for a deep geological repository.



## DEEP GEOLOGICAL REPOSITORY

The radioactive waste will be emplaced deep underground in a tight rock formation. Surface facilities will be required for construction and operation. Shafts will connect these surface facilities to the underground repository.



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