



# Site selection in Switzerland: parallelization of implementer data collection and technical–political decision-making

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**Abstract.** The ambition of the Swiss radioactive waste program is to store waste at the best-suited, safest site in Switzerland. In September 2022 the announcement of Nördlich Lägern as the best-suited site was a major milestone of this site selection process. The full documentation of the site selection and the safety assessment will be submitted with the general license application at the end of 2024. The total time of the site selection process from its formal initiation in 2008 until submission of the general license application will be 16 years.

The three-phase site selection process consisted of (1) initial screening, (2) de-selection of less favourable sites and (3) identification of the best-suited region. The database was refined for each selection step, but detailed site characterization was restricted to the final phase. The selection criteria were kept unchanged in the entire process. Four groups were used: (1) properties of the host rock; (2) long-term evolution of the geological situation; (3) quality of the geological findings; (4) engineering feasibility. The requirements for the criteria were re-adjusted in each phase to honour the available data and to adopt the requirements to the increasing quality of the sites as less-suited regions were continuously screened out. Initial estimates for the duration of the site selection were in the range of 8–10 years. Soon it became clear that the technical work and the decision-making process for each phase would take additional time. To minimize phases of low activity, NAGRA started data collection campaigns for each step as soon as possible. This led to overlapping of regulator reviews and decision-making by the government for the previous step and data collection by NAGRA for the next step. Step-1 data collection started as soon as enough information about the process was available. This allowed the proposal of the initial selection of sites a few months later. Data collection for step 2 with seismic data reprocessing, outcrop work, investigations of third-party boreholes, regional seismic and geodetic monitoring and 2D fill-in lines began in 2009/10, well before the decision on step 1 by the federal government in 2011. This overlap allowed the proposal for the detailed sited investigations in 2014 to be prepared. Step 3 data collection with 3D seismic campaigns started in 2015. To minimize the delay between the 3D seismic investigations and the start of deep drillings, drill sites were planned on available 2D seismic information. In 2017 initial 3D seismic data became available, the drilling sequence was adopted accordingly and the first applications for the drill sites were handed in. The licensing of the drill sites was continuously adjusted together with the involved authorities. The decision of the federal government on completion of the second phase, confirming three sites for the third and last phase, was taken in 2018. The data collection in the third and final step was completed with the ninth deep borehole in early 2022. Close monitoring of the incoming data allowed the announcement of the best-suited site in September of the same year.