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## The Bruderheim hydrogen storage project

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### ABSTRACT

The Lotsberg Formation in Alberta (Canada) had been identified as a candidate for large-scale hydrogen storage. This formation is a laterally extensive evaporitic deposit of the Lower Devonian, extending throughout east-central Alberta. The evaporitic salt consists of an upper and lower unit, having an approximate thickness of 120 meters, and in the Bruderheim area, overlies the Basal Red Beds. The Lotsberg is overlain with anhydrite and interbedded shales. A cavern has been created using solution mining, with an estimated present volume of 335,000 cubic meters. Given the depth, the stable tectonic environment, and the proximity to infrastructure, the Lotsberg Formation is a prime candidate for large-scale, long-term hydrogen storage.

Hydrogen storage requires more stringent geological conditions when compared to crude oil, natural gas, or CO<sub>2</sub>. We will evaluate the Lotsberg Formation salt cavern itself, the cap rock, and the geological conditions of the surrounding area. The Bruderheim area is in a region with minimal seismologic risk, and the salts have remained intact since their deposition.

Our project compares favourably with existing hydrogen projects elsewhere in the world. For comparison's sake, two current examples are located in Kiel (Germany), and Spindletop (Texas - USA). At these storage sites, the hydrogen is stored within salt diapers.



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Figure 1. A core photo from the Lotsberg Formation Salt, TWP 55-20W4. This section was removed using solution mining to create the salt cavern.



Figure 2. A core photo from the cap rock that seals the Lotsberg Formation Salt, TWP 55-20W4.