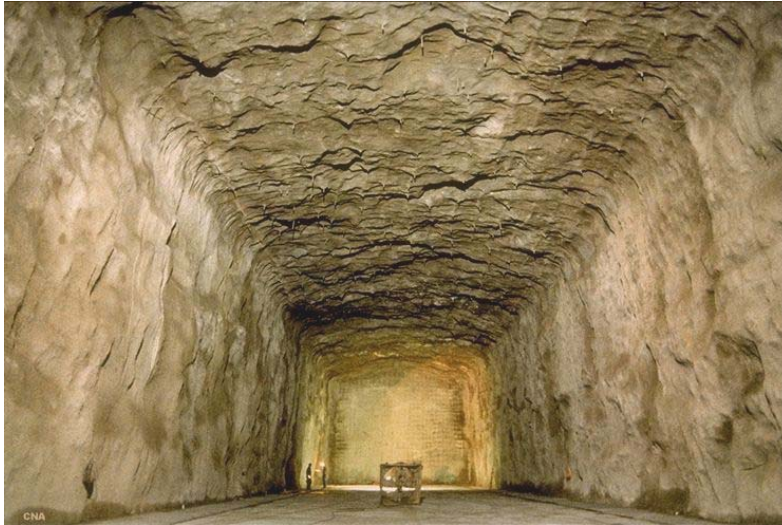


## Soudan 2 Proton Decay Detector Laboratory

CNA was the prime consultant for feasibility study, site selection and investigation, design, construction management, and inspection for this large, underground physics laboratory in northern Minnesota. Completed in 1986, the cavern was built at a depth of 2340 ft in a metamorphosed basalt locally called greenstone.

The cavern, 235 ft long by 38 ft high by 45.5 ft wide, was excavated by drill and blast methods and mucked by crawler tractor and mine hoist. The excavation sequence consisted of twin top-heading pilot tunnels followed by removal of the top heading pillar and finally the bench.



Initial support and final lining consisted of full length resin grouted rockbolts and reinforced and plain shotcrete. The performance of the rock and support systems was tracked with single point extensometers, convergence measurements and surface observations by sounding and visual inspections.

The cavern was outfitted for large-scale physics experiments by installation of a craneway and support structures of structural steel and reinforce concrete. Mechanical and electrical equipment was installed to support a high-power consumption science laboratory.



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**Owner — University of Minnesota, School of Physics & Astronomy**

**Completion Date — 1986**

**Construction Cost — \$2.25 million**

**CNA**  
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