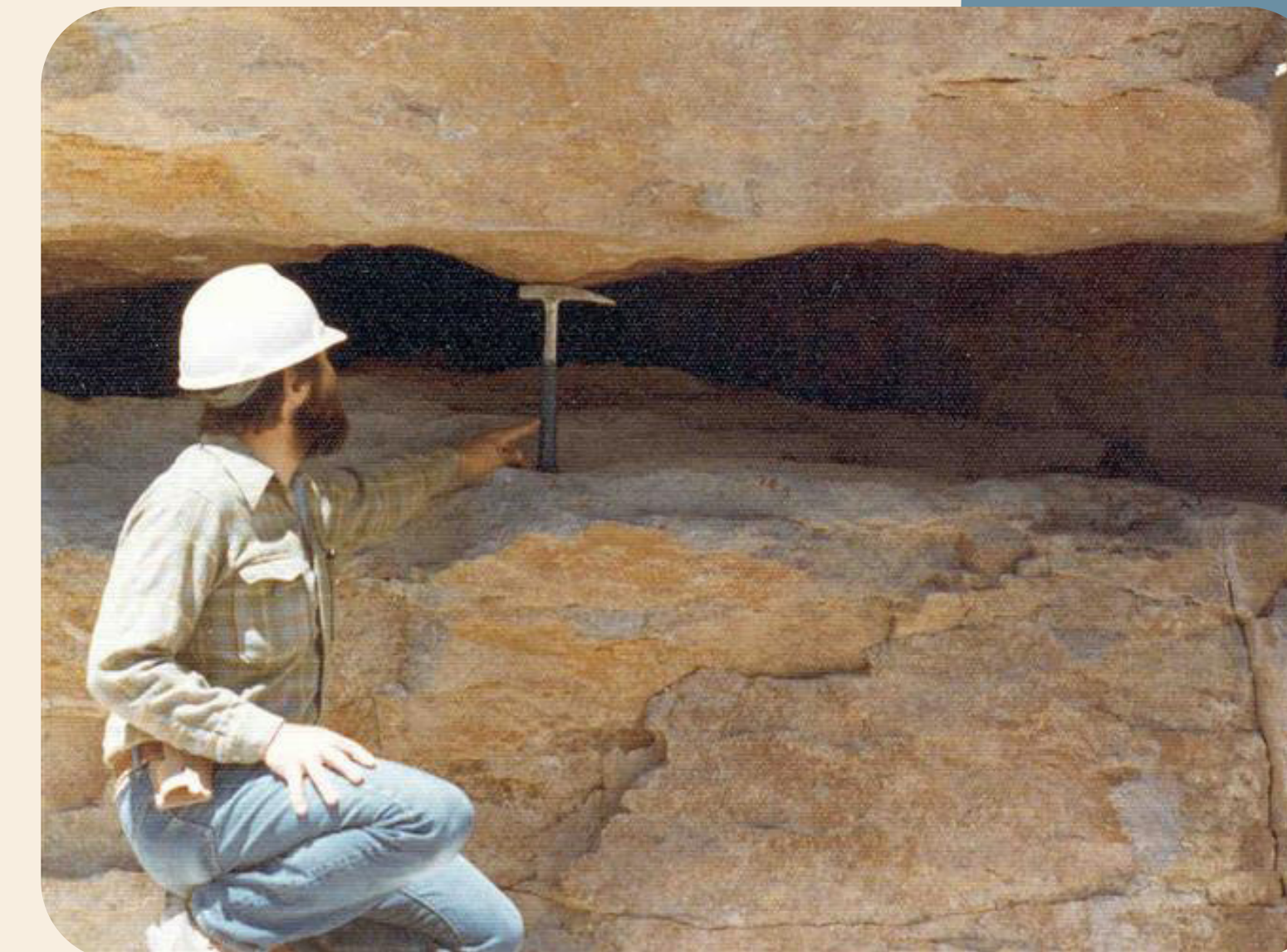


Above: View of Teton Dam, powerhouse, and spillway structures.

Teton Dam Construction and geology

Construction began in 1972. Geological challenges surfaced, with volcanic rocks that were highly porous and intensely jointed. Excavation revealed large fissures and caves on the right side of the dam facing downstream.

The volcanic bedrock beneath the dam had natural cracks that allowed water to seep through. To prevent this and protect the foundation, engineers used a grout curtain. They injected grout, a concrete-like mixture, deep underground through steel pipes. As the pipes were removed, the grout filled the cracks and hardened into a barrier. This was done hundreds of times along the dam's base, creating a hidden wall to hold back the reservoir's pressure.



A worker examining a fissure in the bedrock.

Challenges

Sealing the bedrock was harder than expected. Workers pumped in over twice the budgeted amount of grout, but the fissures—especially those near elevation 5200—continued to absorb the material. Eventually, grouting stopped because of cost overruns, leaving some fractures partially sealed.

In an effort to reduce the need for grouting, key trenches were included as part of the foundation design. The failure process initiated when reservoir water was able to break through the right key trench, allowing the erodible backfill material to be carried into open fractures downstream.

Teton Dam quick facts

- Storage capacity was 288,000 acre-feet
- Structural height was 305 feet above ground surface and extended 100 feet below ground surface
- Crest length was 3,100 feet
- Spillway length was 1,800 feet
- Approximately 10 million cubic yards of material was used to construct the dam
- Estimated total cost: \$49 million, equivalent to \$360 million in 2025

Teton Dam profile (pre-failure, looking downstream)

