

Introduction

Engineering analyses of structures in geotechnical materials are generally based on data obtained from appropriate laboratory and/or in situ tests. Where the structure and rock type consists of caverns mined in rock salt an appropriate test for estimating time dependent cavern closure incorporates monitoring closure of exploratory boreholes drilled at the sites and depths corresponding to the planned caverns.

Closure of mined openings in rock salt is driven by the "pressure difference" (Röhr, 1974) or "effective overburden" (Thoms, et al 1980). Figure 1 depicts the variation of this effect during the operation of a gas or compressed air energy storage cavern. Likewise, exploratory boreholes in salt are subjected to closure effects due to the difference in the in situ stress in the surrounding salt and the pressure or "head" of the borehole fluid.

A borehole closure monitoring program is described herein which employed conventional caliper survey "tools" at selected intervals of time. The time dependent closure of exploratory boreholes drilled to approximately the same depth in two salt domes only 20 miles apart was found to differ significantly.