SOLUTION MINING
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MEETING
PAPER

Stoping in Weak Rock over Salt Solution Cavities in the Hengelo Field, The Netherlands, and Its Expression in Terms of Surface Subsidence

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Abstract

In the Hengelo area, East Netherlands, solution mining of rock salt is carried out by Akzo-Nobel from a 50 m thick salt deposit of Triassic age, located at about 350 m depth. Due to inadequate mining methods in the past progressive roof failure occurred at some of the oldest wells, which gave rise to considerable subsidence at the surface. For many wells seismic data, sonar measurements, recordings of casing damages, exploration well data, levelling measurements etc., collected over a period of more than 50 years by the mining company, were analyzed. This allowed to determine accurately characteristics which had not been previously be established like bulking factors and stoping rates. Over upward migrating cavities three distinct, subsequent phases of surface subsidence could be detected, which correspond respectively with convergence of the cavity situated within the salt formation, upward cavity migration through the claystones and gradual deflection of the soil mass over a cavity migrated up to the rock-soil interface. Hence surface subsidence measurements can constitute a method to estimate developments in the subsurface.