

# **EARTH FISSURING AND LAND SUBSIDENCE IN WESTERN SAUDI ARABIA**

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## **ABSTRACT**

The present investigation deals with the engineering geological evaluation of earth fissuring associated with land subsidence in Wad Al-Yutamah. The investigations include surface mapping and sampling, insitu and laboratory soil testing, water well inventory, geophysical survey, and monitoring of open fissures and level of wadi floor.

The earth fissures in the area were developed as a result of land subsidence due to man-induced water level declines where pumping water from the wadi aquifer was hydrogeologically exceeding the safe yield. This situation was produced a compaction of underlying unconsolidated sediments and formed hair fissures above ridges and steps of buried surface bedrock. These hair fissures enlarged later after flood erosion and possible enhancement with hydrocompaction.

The wadi soil in the study area consists mainly of silt of low plasticity, low density and high void ratio and it was classified as loess like material and collapsing soil. The settlement in the area is greatly increased by excessive wetting under constant pressures. The calculated coefficients of subsidence (collapse) show that the wadi soils were considered to pose moderate problem to trouble when wetted.

Monitoring of the existing open earth fissures using extensometer indicates that the width of the fissure increases after flooding or rain falls. Monitoring of the ground level using GPS technique shows a good relation between the declination of water table and the subsidence of the ground of the wadi floor.