Subsidence faulting and aquifer vulnerability – their relation in Irapuato, Mexico

A. SCHROEDER¹ & R. RODRIGUEZ²

¹Programa de posgrado en Ciencias de la Tierra Universidad Nacional Autónoma de México, Cd. Universitaria, Del. Coyoacán, 04510 Mexico
schroeder.aaa@gmail.com

²Instituto de Geofísica, Universidad Nacional Autónoma de México, Cd. Universitaria, Del. Coyoacán, 04510 Mexico

Abstract In areas affected by subsidence the occurrence of fractures and faults alter aquifer vulnerability. Faults act as preferential channels for infiltration, fluid flow and solute transport. In urban areas faults break water-supply and wastewater pipelines. Chlorination transformation by-products can be found in the groundwater. Methods like SINTACS allow the incorporation of faults in aquifer vulnerability assessment through permeability values. The vulnerability assessment method, SINTACS was applied in Irapuato, Guanajuato state, central Mexico. Faults were mapped in Irapuato; 15 systems were detected. The intense groundwater abstraction of more than 1600 wells has induced subsidence. Hydrocarbons were detected in groundwater in wells near faults and gas stations. Aquifer pollution affected water supply.

Key words subsidence; abstraction; groundwater