

## Quantification Contaminant Migration in Dindigul Watershed, a Hard Rock Region in Tamilnadu, India

## M. THANGARAJAN

National Geophysical Research Institute, Hyderabad-500007, India.

Mass transport modeling of advection dominant migration phenomenon in a hard rock aquifer was carried out in Dindigul watershed, Kodaganar basin, Tamilnadu (India). The groundwater was contaminated due to heavy discharge of untreated tannery effluents from about 85 tanneries situated around Dindigul Town. About 100 km<sup>2</sup> agricultural land had become barren land and many villages have no potable drinking water and more over the rural folks are suffering from unknown skin diseases. After Supreme Court of India's order, one treatment plant was installed for the treatment of effluents. However the total dissolved level (TDS) at many places are in the range of 6000-10000 mg/l. It was therefore decided to study the migration of contaminants even after the installation of the treatment plant, which treats only the organic pollutants.

A mathematical model of groundwater flow and mass transport was therefore constructed to study the present and future migration of pollutant in and around Dindigul Town. Groundwater flow model is the pre-requisite for a mass transport model, which in turn is used to predict the pollutant migration. The available database was, however, quite sparse. Notwithstanding, efforts were made to arrive at reasonable guesstimates of the characteristic parameters for which no data is available. The preliminary model study has clearly brought out that pollutant migration is dominated by advection phenomenon in Dindigul watershed and as such longitudinal migration is high. Sensitivity analysis was also carried out to understand the influent parameter on the migration sensitivity. The impact of artificial recharge on the reduction of pollutant concentration level was studied through mass transport modeling. Remedial measures to contain the pollutant migration have been suggested.

Keywords: Dindigul watershed, hard rock aquifer, Mass transport modeling and contaminant migration