

## **Assessing the changes in groundwater quality around tanneries: the Chennai example (India)**

**K. BRINDHA & L. ELANGO**

*Department of Geology, Anna University, Chennai – 600 025, India*

[brindhakarthiskeyan@gmail.com](mailto:brindhakarthiskeyan@gmail.com)

**Abstract** A study was carried out with the aim of assessing the groundwater quality with respect to chromium around tanneries in a part of Chennai, southern India. The wastes from these tanneries are treated in the common effluent treatment plant (CETP) and released to open drains that join the Adyar River flowing nearby. Water samples were collected from 22 locations in March 2010 and analysed for chromium content. The chromium concentration in groundwater was compared with the study carried out in 2008. EC ranged from 985 to 5344  $\mu\text{S}/\text{cm}$  and was at permissible levels in only 5.3% of groundwater samples. The chromium concentration ranged from 5 to 35  $\mu\text{g}/\text{L}$  which was within the maximum permissible limit of 50  $\mu\text{g}/\text{L}$  (Bureau of Indian Standards for drinking water quality). A general pattern of high concentration in the northeastern part of the study area was found where the tanning industries and CETP are located. The CETP started functioning in 1995 in this area after stringent rules were imposed to treat the effluent before its disposal. However, before 1995, effluent with high concentration of many ions was released to open drains without proper treatment. In 2008, the chromium concentration in the study area ranged from 4 to 990  $\mu\text{g}/\text{L}$  while EC ranged from 584 to 6690  $\mu\text{S}/\text{cm}$ . Due to the functioning of the CETP, the chromium in groundwater has decreased, as evident from the studies in 2008 and 2010. However, the quality of groundwater based on EC is still poor, which may be because the CETP removes chromium effectively as it is a potentially-toxic heavy metal, rather than decreasing the concentration of all the ions in groundwater. Hence, it is essential to remove the TDS and to frequently monitor the groundwater quality at regular intervals.

**Key words** leather industry; tannery pollution; chromium; electrical conductivity; total dissolved solids; Chennai, India